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## ORIGINAL ARTICLES.

### PRESIDENTIAL ADDRESS ON THE CARE OF EPILEPTICS.

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LET me first express my thanks to you for the great honor you have conferred upon me by electing me President of this useful organization. One of the duties of the office is that of opening the annual convention with a brief address.

Interest in the epileptic has grown of late years with a sort of geometrical progression. It now seems scarcely possible that fifteen years ago one could have written that epileptics were the most neglected of all the world's unfortunates; that physicians took no interest in a disease so familiar that little improvement has been made on the clinical description given by Hippocrates 2,400 years ago, so widespread that one person in 500 is afflicted with it, making a total of perhaps 140,000 cases in the United States alone. No general hospital received the epileptic. No school would accept him as a pupil. Playmates shunned him. The church was closed to him. No employer would keep him in his employment after his once having had an attack while at his work. Every avenue for mental or moral development, through occupation, schooling, recreation, and association with his fellows was closed to him. He was a burden to his family. The physician pronounced him incurable, and gave him bromides ad libitum, which while often reducing the number of attacks as often wrought physical and mental deterioration. What wonder then that he grew up dull and ignorant, intellectually feeble, morally depraved, irritable in temper, with tendencies to imbecility and insanity rather than to mental advancement.

There were at that time two refuges open to him, the insane asylum and the almshouse, and a considerable percentage of the population of such institutions was made up of sufferers from epilepsy.

But after twenty-four centuries of familiarity with the disease there was in 1887 a sudden general awakening to the actual state of the epileptic as described above. Simultaneously in England and the United States, movements were set on foot to better his condition. Some years before this a Lutheran pastor in Germany had in a quiet way, and quite unknown to the rest of the world studied the condition of this class, and worked out a successful solution of the whole problem of their care in the noble colony scheme which he inaugurated at Bielefeld. It was the published descriptions of this colony in various English and American periodicals that first aroused public attention in these countries.

It is true that one or two private institutions in Europe had provided homes for epileptics previous to the undertaking at Bielefeld, and it is also true that the State Board of Charities of Ohio had considered long previously to 1887 the need of some special provision for epileptics; but whatever had been done or considered was as nothing compared with the scheme ideally conceived, and successfully executed by Pastor von Bodelschwingh at the little German town in Westphalia. Here grew up from small beginnings a village inhabited solely by epileptics, and their caretakers, instructors and physicians. Here everything was provided to meet their peculiar needs, to make up for their deprivations in the outside world. They were supplied with schools to improve their minds, industrial teachers to make them more or less self-supporting, and physicians to study their cases and improve or cure them. Outdoor occupations were especially favored as helping to ward off attacks. Special diet so useful in epilepsy, was provided. Recreations, amusements and religious instruction were features in the plan. For such as were incapable of improvement or cure, the colony was to be a home, and a home in the real sense of the word; not a great barrack-like structure in which patients might go by numbers, and in droves with lost individualities, but a village of small houses, each of which under the care of housefather or housemother became a little family home by itself. And the spirit which governed this great aggregation of unfortunates, and which penetrated into every home and informed the whole was a unique and wonderful benevolence.

When the success of this scheme became known to the world, its effect in various countries was magical. Immediately steps began to be taken everywhere to provide for epileptics. Other colonies were founded in Germany, in Switzerland, in Holland, in France, and in England. Ohio established the first institution for epileptics in the United States, though, unfortunately, on the hospital rather than the colony scheme. New York has the Craig Colony, at Sonyea, closely modeled on the Bielefeld plan, and with a population today of 825 epileptics, the exact number of colonists at Bielefeld when I first visited it in 1887. Under Dr. Bullard, Massachusetts erected a colony at Palmer. Dr. Sinkler was the prime mover in the establishment of a colony farm at Oakbourne for epileptics in Pennsylvania. There is a New Jersey State Village for Epileptics at Skillman, described by Dr. Weeks in the published report of the Association. A colony for epileptics is in course of construction at Abilene for the State of Texas, an account of which has been

written by Dr. Worsham for the Annual Report of this Association. Dr. Drewry is rapidly pushing the matter of special provision for epileptics in Virginia. There are strong movements on foot for similar projects in Illinois, Connecticut, Indiana, Kansas, North Carolina, Missouri and Minnesota. Dr. Osborne has been indefatigable for years in his efforts to achieve the same purpose in California.

In other countries there has been equal activity. England was the first to found a National Society for the Employment of Epileptics, and a fine colony has been established by this body at Chalfont St. Peter. In addition to this there is one near Liverpool (the Maghull Home), one at Godalming (Meath Home), a large colony at Chelford, just being constructed through the munificent bequest of David Lewis, and finally a fifth institution in England is about completed, for the City of London, not far from Croydon.

A reference to the recently published Annual Report of our own National Association for the Study of Epilepsy and the Care and Treatment of Epileptics (founded in 1898) shows how widespread is the movement for the special care of epileptics all over the world, for here are articles by agitators of the subject in Brazil, Belgium, Switzerland, Sweden, Russia, Italy, Turkey, India, Japan and Australia. At this present session just opening to-day, we shall doubtless hear still further good news of the growing interest in the objects of our solicitude in all quarters of the earth.

The particular purposes of this Association as set forth at the time of its foundation were as follows:

1. To promote the general welfare of sufferers from epilepsy.

2. To stimulate the study of the causes and the methods of cure of this disease.

3. To advocate the care of epileptics in institutions where they may (*a*) receive a common school education; (*b*) acquire trades; (*c*) be treated by the best medical skill for their malady.

4. To assist the various States in America in making proper provision for epileptics.

To these ends we have invited citizens of all parts of the United States to become members and to take part in our deliberations, not only physicians and scientists who may aid us in the study of the causes and methods of cure of epilepsy, but also State officials, jurists, clergymen, teachers, philanthropists, and in fact all persons who for any reason might feel an interest in the objects of this organization. There is no initiation fee, and there are no dues. The association has relied upon voluntary subscriptions for means to defray its expenses. The cost of publication of last year's proceedings, amounting to over $600, was defrayed by Mr. Letchworth, our first president, and the means for issuing the records of to-day's session are already forthcoming.

While we have every reason for congratulation on the amazing accomplishments of fifteen years, there are still directions in which this body can be of service. There are many States of the Union still unaware of the conditions of these unfortunates gathered together in their almshouses and asylums. If in such commonwealths the Presidents of the State Medical Societies would appoint committees of medical men to inquire into the numbers and needs of their epileptics, an excellent beginning would be made, and by arousing general public interest great ultimate good would result. Incidentally, by such schemes already undertaken in certain States, and through the dissemination of literature by this and kindred societies and their members, a new interest in the disease itself has grown up among medical men the world over. More attention is being given to the patients suffering from epilepsy. New remedies are being brought forward. In the laboratories the pathology is being reinvestigated according to new methods. This disorder which has been the *opprobrium medicum* for 24 centuries will surely some day give up to us the secrets of its prevention, causes and cure.

Now, in closing, let me say one word more by way of appeal to those who cannot contribute to the advance of our work in any other way—money could not be better expended than by donations for the following purposes, viz.:

To spread throughout the Union literature relating to the colonization of epileptics.

To establish in the colonies now existing, trades schools, churches, libraries, and other features for promotion of the general welfare of the patients already gathered together.

Last, but not least, to found and endow laboratories in connection with every institution for epileptics wherein the disease may be investigated by trained scientists for the purpose of discovering its causes and its remedies.

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## NATURE, FREQUENCY AND POSSIBLE SIGNIFICANCE OF THE VARIOUS FORMS OF EPILEPTIC AURA.*

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IN its literal meaning the word aura signifies "vapor or emanation from the body, surrounding it like an atmosphere;" though in the sense in which it is employed to indicate a warning of an approaching attack, it has come through usage to have a much broader application. It appears originally to have been used by the ancient Greeks, who thought the fit began in the form of a "spirituous vapor" in the veins of the extremities that ascended to the head, when the patient became unconscious.

For a long time it was held that the nervous impulse or irritation causing the spasm began in the part where the aura first occurred, though now it is generally held that in the vast majority

* Read before the New York Academy of Medicine, Section on General Medicine, April 21, 1903.

of cases the impulse begins in the central nervous system, the sensation only being referred to the periphery. At the same time, there may be an occasional case in which the impulse starts at the periphery, as has been shown by the cessation of the attacks when the local irritation was removed; an irritation like an adherent prepuce, or a stricture of the urethra; or again when the tying of a cord tightly about the member affected would check the progress of the fit. But in all such cases the question arises as to whether we ought to designate them as epileptic, or simply as reflex, or epileptiform.

It is well known how disease of the brain may cause descending degeneration of the spinal cord, or ascending disease in the spinal cord produce disease of the brain. Experiments have proved that a nervous injury in the periphery may not only cause changes in the central nervous system, but structural alterations in nervous tissue and functions in other parts of the periphery.

Brown-Sequard showed this to be true when he cut the sciatic nerve in the leg of a guinea pig and caused structural alteration in the skin of the face, afterward producing epileptiform convulsions by irritating certain portions of the face, then removing the basis of the attacks by excising this epileptogenous area.

We may also mention in this connection the referred sensations in coxalgia, the pain being most sharply felt in the knee and ankle joint, and the acute gastric pains that often follow vertebral disease.

On the other hand, there has been a growing tendency for some years past to regard the aura as essentially constituting a part of the epileptic attack, and this seems to us to be entirely reasonable; fully as much so as it is to regard fever and congestion as preliminary parts of pneumonia, when pneumonia follows. Sometimes the aura arises and persists for an indefinite period and disappears without an attack following; just as there may be fever and congestion of the lungs without pneumonia following. It is, therefore, in our opinion, a good plan to look upon the aura as the commencement of the fit, not simply as a warning of its approach, and to treat the case accordingly.

Unfortunately this cannot often be done, for it is rare for the physician to see the patient before the convulsion has occurred, the aura being not far removed from the attack itself, generally not more than a few seconds, occasionally half an hour or so, while in very exceptional instances the period is longer.

We can best study the various auras by grouping them under four heads as follows: (1) psychic, (2) sensory, (3) motor, and (4) irregular. The first including some disturbance in the patient's mentality; the second some disturbance in sensation; the third some disturbance in his motor system; while the fourth embraces elements of two or more, or even of all of these.

It is difficult to say which of these forms of aura possesses the greater clinical importance, though because they so greatly outnumber all the rest we incline to attach the greatest weight to those of a sensory nature; those in which a feeling of some kind, a numbness, or tingling, or pain, or feeling of discomfort, is felt for variable and indefinite periods before the fit comes on.

In a close analysis of 815 males and 510 females for the establishment of individual auras, it was found that 319 males, equal to 36⅓ per cent. of the entire number, and 186 females, equal to 36½ per cent. of the entire number, had a sensory aura of some kind. It is worth noting how remarkably even this form of aura ran parallel in the two sexes.

In the same cases, 33 males and 19 females had psychic auras, the 52 cases in both sexes constituting less than four per cent. of the entire number, while 22 males and 10 females, 32 in all, a fraction over two per cent. of the total, had a motor aura of some kind. Combining all who had an aura of some kind, we have a total of 589 out of 1,325, equal to about 45 per cent., leaving 55 per cent. who had no aura.

It appears from this that less than one-half of all cases have a specialized aura, though it is best not to regard this as conclusive, for it is reasonable to suppose that some epileptics of low intelligence experience sensory auras they are unable to describe. Allowing for these, it seems safe to say that 50 epileptics out of every 100 have an aura of some kind.

This proportion is much greater than that mentioned by Echevveria, who states that a perceived aura was found in 10 per cent. of the males and 11½ per cent. of the females in the 306 cases studied by him.

Gowers classifies the auras under seven groups, in substance as follows: "(*a*) unilateral; (*b*) certain general auras such as sensations in the limbs, tremors, faintness, etc.; (*c*) auras referred to certain organs, especially those supplied by the pneumogastric nerve, most of the visceral warning coming under this head; (*d*) vertigo and allied sensations; (*e*) certain sensations in the head, pain, etc.; (*f*) psychical auras, the consciousness of an emotion or idea; (*g*) special sense warnings, some of these being unilateral;" and in 1,000 cases found

(*a*) A unilateral aura in 86, topographically distributed as follows: in the arm in 45 cases, legs 15, face 17, tongue 7, trunk 2. (*b*) Bilateral general aura in 74, in the arms 11, legs 12; shivering, trembling, nausea and weakness in 51. (*c*) Auras affecting organs, 106. (*d*) Fainting and dizzy aura, 90. (*e*) Head aura, 50. (*f*) Psychic aura, 25. (*g*) Aura of the special senses, 119.

A total of 600 epileptics out of 1,000 cases observed by Gowers had an aura of some kind.

According to Binswanger, Herpin found an aura of the sense organs in 27 per cent. of all cases; while Bennett found an aura of some kind in 34.4 per cent., the latter finding the aura relatively rare in major epilepsy and far more frequent in the milder forms, a fact verified by our own experience.

Voison* and Féré† classify the auras under four heads: motor, sensory, sensorial, and intellectual, following that used by Dela-Siauve, but neither give an estimate of the proportion of each, Fere stating that "it (the aura) is very frequent; O'Connor has found it in 78 cases out of 100."

According to Féré, "Thorion claims that the epileptic crisis is preceded by a greatly increased elimination of the urinary elements, a veritable discharge; this chemical aura he thinks might even enable one to predict the return of the attack."

It is impossible to estimate with accuracy the number who have irregular forms of auras, but they are not common, occurring less frequently than those of a psychic nature.

This form was illustrated in a woman who first experienced a feeling of buoyancy and exhilaration, that later on gave way to a highly emotional state that persisted for several days, and sometimes even for weeks, before an attack; while for two or three days before the attacks a motor aura in the way of uncertainty of gait, the patient stumbling along as though half tipsy, or the inability to grasp or pick up a small object like a button or a large needle, appeared and grew more pronounced until the fit was over, when this bilateral paretic condition and unbalanced emotional state both completely disappeared.

Psychical aura may appear in the form of a sudden abnormal mental state, leaving a definite impression on the memory, due to the fact that brain processes which attend mental states may leave a residual effect which makes it possible for their subsequent revival, the perception of which we are apt to refer to as "psychical sensations."

The most common form assumed by the psychical aura is the sudden acceleration of the imagination, a quick overflowing of the processes of thought, in which the train of the imagination, ever rapid, is rushed ahead with trembling, excited haste, until the thread is snapped and unconsciousness occurs.

In some cases this stimulated speed of the imagination may be preceded by confused ideation, with different memory pictures appearing momentarily in succession.

Romberg mentions a young man with epilepsy who for nine years had the same recurring thought which was never quite clear to him and which caused him great unrest. He endeavored to free himself from the idea which took the same course every time, to disappear with the beginning of the attack.

Binswanger states that "similar observations in which in each attack definite memory pictures appeared in 'glaring psychic illuminations' are found still in the literature."

When such sensations precede an epileptic fit, they may also be in the simpler form of an emotion or an idea, the former generally being in the form of fear, an apprehension of something evil about to occur, the patient being genuinely frightened and attempting to run away. We have seen a number of cases in which the patient's face wore a terrified aspect, in one or two instances trying to run away from danger the patient felt in some way impending. The presence of the feeling of fear is also testified to by patients who involuntarily show fight when interfered with while in a seizure or just as they are going into one.

A young man was subject to frequent attacks of psychic epilepsy, during which he would appear pale, confused and ill for some time before the fit, and not infrequently got into trouble in public places by assaulting the person who felt it his duty to care for him when he seemed to require it. If let alone, he would pass through the seizure all right, but the moment a hand was laid on him to assist him, he became extremely violent and would fight with great vigor until he was overpowered. He was always ignorant of his acts in this respect after his fit was over.

Fear of a primary, instinctive, and therefore of an unreasoning kind, is the type met with in psychical aura, and it springs from the instinct of individual conservation.

According to Th. Ribot, in "The Psychology of the Emotions," fear is the first, in chronological order, of the instincts to appear, showing itself, according to Preyer, at twenty-three days, according to Perez, at two months, and according to Drawin, at four months.

Ribot then goes on to speak of the characteristic marks of fear, so far as it affects the innervation of the voluntary muscles; of the muscles of organic life, and finally of the vaso-motor apparatus, the concrete results making a very distinct picture of the condition of fear.

The very interesting question now arises as to how fear can be artificially induced; in other words, what is the process that brings it into existence so that it stands for a symptom in part of an epileptic convulsion? If we could answer this, we could place at least a part of our psychological studies on firmer ground.

The warnings which take the form of "ideas" are generally dependent on special sense conceptions, especially on vision. Gowers mentions a woman who saw London in ruins, the Thames emptied to receive them, and herself the lonely survivor. This he calls a manifest "psycho-sensory warning."

All special disturbances such as these have the same basic meaning; they indicate some instability of the centers connected with the psychical processes.

We have just referred to a woman who had an irregular aura, the first part of which was psychic and which gave her a feeling of great buoyancy and exhilaration. While this is not a common aura, it is distinct in type and of more than passing interest.

Binswanger in describing the disturbances of

* L'Epilepsie, 1897, p. 54.
† Epilepsy, Twentieth Century Practice of Medicine, Vol. X, p. 593.

feeling due to an approaching attack, states that "more rarely we find sensations of serenity, placidity, calmness, sudden apparitions of joy, rapture, colossal lightness, an elevating good feeling. Some patients declare that in the beginning of the attack they feel freed from a heavy burden." This exactly portrays the emotional state the Russian novelist Dostoieffsky, who suffered from epilepsy, applies to himself in "Besi."* "There are moments," he writes, "and it is only a matter of five or six seconds, when you suddenly feel the pressure of eternal harmony. This phenomena is neither terrestrial nor celestial, but is an indescribable something which man in his mortal body can scarcely endure. . . . The terrible thing is the frightful clearness with which it manifests itself and the rapture with which it fills you. During those few seconds, I live a whole human existence."

Sensory auras are vastly more common than all the rest and partake of the greatest imaginable range in character. They may be confined to the special senses and include perversions of taste, of smell, of sight and of sound. Any abnormality in the functions of the special sense organs may be fleeting and transitory, or may in some instances persist for hours before the fit comes on.

Visual auras greatly predominate, occurring as often as those of taste, hearing and smell combined. They usually take the form of flashes of light; the colors of the rainbow passing in rapid succession across the field of vision. In other instances they appear in the nature of optical illusions; people, dogs, cats, wild animals of various kinds being engrafted on the visual field; while it still more rarely happens that temporary blindness immediately precedes the attack—Amaurosis epileptica. In some instances the sudden loss of sight may alone constitute the entire attack, the area of the discharging lesion being so circumscribed as to produce no other results; many cases of persons being suddenly stricken blind doubtless being due to this simple cause.

The following instances taken from the author's cases are typical of the more common forms of visual aura: "Flashes of light, then blackness;" "an object passes before the eyes five to ten minutes before the attack;" "dark objects move before the eyes;" "blurred vision;" "flashes of blue and red;" "flashes of light of the rainbow colors;" "at times sees colors;" "sees wavelike motions in the air just before the fit;" "at times have loss of vision;" "visual percepts of light;" "vapor before eyes and numbness in paralyzed hand;" "eyes get dim;" "visual aura at times—sees a policeman;" "partial blindness;" "sees black, then a yellow light;" "occasionally a visual aura—sees stars, at other times the aura is epigastric;" "sees some animal approaching;" "everything looks bigger than it ought to be just before the fit; people, chairs and tables are magnified."

According to Sir William R. Gowers, it is not surprising that when central instability exists, the visual center should often lead the way in the sudden derangement of balance, for light constitutes the most rapid form of motion of which we have any perception, consequently it must be associated with a corresponding degree of delicacy in the central stimulus that receives new impulses produced by waves of light.

In addition to the forms of visual aura in which colors predominate, other sensations occasionally affect the eye just before a fit; one of these being diplopia, or double vision, a case of this kind being mentioned by Gowers, in which the diplopia was associated with an aching in one eye and an apparent magnification of objects to twice their usual size.

This curious condition is seldom encountered, the probable explanation of it being found in the increase or diminution in the sensitiveness of the visual center, which produces an effect on consciousness analogous to that produced by the stimulation of a larger or smaller area of the retina by a larger or smaller image.

A male epileptic, twenty-four years of age, that came under my care, had this aura, objects about him increasing greatly in size 10 to 12 seconds before the fit appeared.

In a few cases there is a sensation of pain in the eyeball, due probably to some irritation of the fifth nerve, these cases generally having a motor element in them, such as twitching of the muscles about the eye.

Gowers reports a case* that came to autopsy in which the fits were preceded by a flash of light or pain in the eye, the autopsy revealing the presence of a tumor in the occipital lobe, which extended as far forward as the angular convolution.

In addition to all these, there have been reported cases of highly specialized visual sensations in the form of complex visual conception, or psychovisual auras; that is, a psychical aura, crowding itself in upon the patient's field of consciousness coincident with the appearance of some distorted visual percepts. For instance, a woman first always saw bright lights—red, green, yellow—and then the lights continuing, she saw a girl "and tried to get to her to ask what the lights meant," and then fell in a fit.

When one color only is seen, it is most apt to be red or blue; the most prominent order of appearance of the colors being red, blue, green, yellow, and occasionally purple. This order is not in harmony with the physical relation of colors, nor does it correspond to the areas of retinal perception, for red, which is oftenest seen, has one of the smallest retinal fields. On the other hand, it does correspond to a certain extent with the degree of visibility of colors, for Gowers credits Cohn with having observed that the order in which spots of color one millimeter in size can be seen in direct sunlight at a certain distance, is as follows: red, blue, green, yellow, violet, which appears to be very nearly the order they appear as auras in epilepsy.

Occasionally we find auditory and visual auras associated, though this combination is rare, while

* The Man of Genius, by Lombroso, 1891, p. 339.

* Epilepsy and Other Convulsive Diseases, p. 79.

we have knowledge of one case in which there was complete unilateral loss of hearing just before the fit.

Auditory auras partake, as a rule, of the nature of the following: "Roaring and voices heard two or three minutes before the convulsion appears;" "roaring in the ears;" "sound of sea waves in the ears before mild attacks;" "roaring and buzzing in the ears;" "noises in the head for a brief period before the attack;" "roaring followed by a sensation of falling."

Auditory auras occur about one-fourth as frequently as those of a visual nature, which are generally present in two per cent. to three per cent. of all cases.

In addition to the forms of auditory disturbance enumerated above, the patient may hear sudden sounds of almost any nature, like the crash of a heavy falling body, the blowing of a whistle, the ringing of a bell; while more rarely there may be the sounds of voices or of music alone.

L. Pierce Clark* quotes Sante de Sanctis and A. Christiani as reporting three cases in which the patients indulged in a variety of songs while undergoing mild convulsive movements; two of them keeping time to imaginary music with rhythmic movements of the body, these two showing some clonic muscular movements in the lower extremities, while the third sang a single tune, accompanying it with movements imitating an orchestral direction.

The writer is familiar with the cases of two young adult male epileptics, one of them victim of an infantile palsy affecting the right hand and foot, both of them subject to grand as well as petit mal attacks, the latter form being not infrequently announced in each by a period of involuntary whistling. I had occasion to witness this phenomenon in one of them five times in one day, the first indication of an attack being a sudden cessation of all movement on the part of the patient; he would stop and stand still if walking, followed by a confused, puzzled expression, when he would grunt quite audibly two or three times, and then whistle a bar from a popular song of the day, repeating it with the next convulsion in the most precise manner. He was fully cognizant afterward of what he had done, as shown by the fact that he always turned to me with the question, "Did you notice that one?"

On one of these occasions, he caused a bank cashier with whom he was dealing at the moment, much astonishment and concern by suddenly repeating the usual grunt two or three times, then whistling a bar from a popular opera while arranging an important financial transaction. None of the anomalous states lasted more than five to seven seconds. At times they appeared as epileptic equivalents, at others as forerunners of more pronounced convulsions.

We recall two cases in which mild seizures were accompanied with complete auditory deafness, the patient's sight remaining normal, so that motions made to the patient to do certain things were immediately obeyed, while spoken commands were unnoticed.

Extraordinary sensations in connection with olfaction and the gustatory sense are occasionally met with, while they take the greatest possible range in character and are generally of an unpleasant nature.

Gowers thinks it significant that flavors which are perceived only through the olfactory nerve seem to be associated with taste in the central discharge which causes the warning, the flavor in this instance being of a kind that enters the posterior nares, causing a simultaneous stimulation of the true gustatory nerve.

Some epileptics experience a bitter taste, like quinine, while others have a metallic taste in the mouth that sometimes persists for an hour or more before the convulsion. One patient complained of a feeling of "numbness in the tongue," as though that organ had been completely cocainized, while Watson mentions an epileptic who could abort an approaching attack through voluntarily biting his tongue quite severely, doubtless having first experienced an unusual sensation of some kind in it.

Hughlings-Jackson* speaks of having drawn attention to a group of cases in which there is at the onset of the paroxysms a crude sensation of smell or of taste, in which there are movements of chewing, smacking of the lips, and sometimes spitting, all being ascribed to disturbances in the cortex. Some of these are foreshadowed by an epigastric warning.

A. T. states that he almost always has light attacks following severe ones at night, and following the light attacks he has a peculiar taste and sensation in the mouth which he describes as follows: The first is a "sour taste;" the second similar to that of "wheat bran in the mouth;" the third a feeling of "stringiness," combined with "numbness in the upper part of the mouth;" the fourth a "sickish, sweet taste" great enough to produce extreme nausea; the fifth a "filthy, nasty taste" which is extremely disagreeable; the sixth and last being a feeling of "sliminess" in the mouth.

These disorders of taste may persist for a day and gradually shade out from the sixth condition to that of normal sensation.

The morning following the patient feels "unusually well;" much more so than during any time more distant from his seizures. These disorders of taste persisted for years, and patient states that they cannot be ascribed to stomachic indigestion.

According to Ferrier, the senses of taste and smell are located in the uncinate gyrus, since reflex irritations of this gyrus in the animals he experimented on produced "reflex" movements analagous to those just mentioned as occurring in the human subject prior to, or as a concomitant of lesser epileptic convulsions.

*The epigastric aura* is more commonly met with than all the other sensory auras combined, its presence having been noted in some form in 200

* MEDICAL NEWS, Sept. 1, 1900.

* The Lancet, Jan. 14, 1899.

cases, equal to 15 per cent. of the 1,325 studied by me.

The nature of this aura is not very variable, for it quite constantly appears in one of three forms: the first and most common being that of "a gnawing, indescribable, indefinable sensation at the pit of the stomach" that lasts anywhere from a few seconds up to, but rarely beyond, half an hour before the fit is established; the second being "a deep-seated burning pain;" the third "a feeling of nausea that grows in intensity and rises like a choking sensation toward the head until the sensation reaches the throat, when consciousness is lost;" the latter closely resembling the globus hystericus.

The location and cause of the pain in these cases is entirely problematical. They may be due to some disturbance about the centric origin of the vagus nerve, which has a wider distribution than any other of the cranial nerves, supplying the organs of voice and respiration with both motor and sensory fibers, the pharynx, esophagus, stomach and heart with motor fibers. Its immediate communications are extensive and remote, while the seat of its origin is in control over the two vital processes of respiration and circulation.

The rhythmic sequence of the respiratory movements are apparently due to periodic discharges from the respiratory center located in the floor of the fourth ventricle on each side of the median line, the two halves being intimately connected by commissural fibers. The cause of this periodicity is obscure, but since it has been shown* that after the combined section of the vagi and glossopharyngeal nerves, the spinal cord in the lower cervical region, the posterior roots of the cervical spinal nerves, and the separation of the spinal bulb from the parts above, the rhythm continues, indicates that such periodicity is inherent in the nerve cells and is not caused by external stimuli carried to the center through afferent fibers.

Loewy has shown that under the above circumstances, the rhythm is due to the blood "which, while acting as a continuous excitant, causes discontinuous or periodic discharges," and since the blood supply is under nervous control, the respiratory center is automatic only with reference to external nerve stimulation.

The problem in epilepsy that rests on this point is to determine whether the initial disturbance, *the thing that breaks up the rhythmic periodicity of the respiratory impulse*, is to be sought in the respiratory center primarily, or whether it lies somewhere in the periphery, in the stomach or heart, or especially in the circulation, and is carried by some vital process to the seat of the respiratory life.

It is unusual for the epigastric aura to be referred to any other locality than the immediate region of the stomach. In one case the pain first appeared in the right ileac region, and was always attended with a feeling of nausea, and it is noteworthy that while the vague sensation that nearly always accompanies it passes upward to the throat and head, the pain remains stationary in the region of the stomach. As a rule, as soon as the aura reaches the head, consciousness is immediately lost.

Many cases that exhibit the epigastric aura suffer from indigestion, that makes its appearance to some extent periodically; other stomach disorders being distention, gastric catarrh and flatulence.

It seems now a problem as to whether these conditions precede or follow the initial manifestations of the fit, and on this point we differ with Sir William R. Gowers, who goes so far as to say, "We are not justified in assuming that flatulence is the cause of the attack any more than we are in regarding gastric disturbance as the cause of an attack of migraine which subsides with vomiting." It seems entirely rational to hold that while the flatulence itself may not induce the attack, the conditions that caused the flatulence may alone be to blame for it; for the reason that correction of deep-seated disturbances in the processes of nutrition often possess the power of lessening or entirely removing the cause of the attacks.

All this leads to a belief in the importance of studying chemical pathology as a cause of epilepsy, a vast, prolific field as yet but little explored and still less understood. At the same time, we do not wish to be understood as claiming that the cause in such cases is never wholly centric, for minute, capillary hemorrhages, or small spots of softening due to thrombus or embolism or other lesions we are not yet familiar with, may act in the same way.

It is often difficult to determine *motorial* forms of auras from the beginning of the convulsive period itself. Indeed, as we have previously stated, auras of all kinds might very properly be looked upon as the entering wedge of the fit itself, notwithstanding that it may at times come and go without expanding into a convulsion.

We recall the case of a man, twenty-eight years of age, who had a persistent motor aura in a jerking movement that began in the right arm, just enough at first to lift the arm a few inches from his lap, but that grew stronger each time, the jerks being two to three seconds apart, until the arm was raised at each impulse straight above the head. So soon as this condition was reached, the jerking would commence in the left arm, and after it had gone through the same course, so that both arms were finally being jerked over the head at each impulse, a general convulsion would appear, the whole body being involved, the patient dropping unconscious to the floor. It required at times half to three-quarters of an hour for these motor manifestations to develop up to the convulsive point, a sufficient length of time to administer a remedy that often served to abort the attack.

One of the most common forms of motor disturbance is that of running just before the fit, the so-called Procursive Epilepsy. Cases that exhibit

* Vide American Text-book of Physiology, p. 458.

this phenomenon are rare, and as a rule are apt to be extremely violent during the attack. We recall the case of a boy who would start and literally run like a deer for half a mile before falling in an active convulsion, which was always followed by great exhaustion.

Another case of the kind was that of a young married woman, who seemed to possess superhuman strength from the way she demolished the stoutest woodwork when in a grand mal seizure, and who could not be allowed out of the hospital for a walk because when about to have an attack, she would run far enough away from the attendant to get lost.

When a seizure appeared while she was on the ward she would run at breakneck speed its entire length, about 120 feet, jump up and thrust both legs through the window and out through the spaces between the iron bars, remaining in this position until the worst of the convulsion was over, it being almost impossible to tear her grip loose from the iron bars.

Gould and Pyle (Anomalies and Curiosities of Medicine, p. 852) mention "a peculiar case of epilepsy, the patient being a workman who would be suddenly seized with a paroxysm and unconsciously run some distance at full speed. On one occasion he ran from Peterboro to Whittlessy, when he was stopped and brought back, while on another occasion he ran into a pit containing six feet of water, from which he was rescued."

Echevveria* described the case of a woman, twenty-two years old, who had general convulsions that always occurred in the day time, the attacks being preceded by an uncontrollable desire to run. If held at the time and violently shaken, the paroxysms would occasionally be cut short and their intensity diminished.

These "running fits" came on at the age of twelve years and grew steadily worse, until the girl's mind was practically destroyed. As a remedy, it was directed that "she try violent exercise at skipping the rope in addition to having a seton in the back of her neck, and being made to take large doses of the bromide of potassium and conium;" the author adding, "The perturbation caused by the violent jumping evidently proved of great avail. No fits repeated in the course of three weeks after commencing the above treatment joined to a tonic regimen."

The same writer mentions that violent exercise in a trapeze controlled the spasms in another patient; the patient resorting to the practice of his own accord in the belief that bodily fatigue would keep off the convulsions.

A carpenter's son, a young man of twenty-four years, of powerful physique, often showed the first evidence of an attack by suddenly springing into the air, sometimes with such force as to turn a complete somersault, generally falling on his back and head; immediately after which clonic contractions would set in, those being so violent as to require five to six strong men to hold him so that he would not injure himself too severely; but as it was, his body for weeks after an attack was often covered with sores, bruises and scars.

Other epileptics turn completely around one or more times before the attack comes on, the direction of turning being uniform; that is, if they turn to the left this time, they will turn to the left in subsequent attacks. Some walk backward a few steps, then fall heavily, striking on the occiput, repeating this often enough to keep an unhealing wound on the scalp at that point, unless a pad is worn to prevent it.

"Trembling from head to foot," as patients describe it, is witnessed in some cases, conjointly or not with an epigastric aura, while a feeling of "giddiness" just before the fit is comparatively common.

Isolated contractions of certain parts of the body, like the thumb or fingers, or the great toe, may also announce the coming of an attack.

A woman who came under the writer's care a few years ago, began at one o'clock in the night to have a series of convulsions that were checked after the eighth one, to recur six hours later, and that kept recurring 49½ hours, when 549 had taken place, the initial spasm each time being the sharp, clear contraction of the first phalanx of the right thumb. After the two hundredth seizure, the patient went into status, the temperature gradually rising to 107° F.; death occurring just at the beginning of the third day.

Some have a warning of an attack in "a sleepy feeling," somnolence. It is impossible for them to keep normally awake. This feeling may exist for a day or so before the convulsion appears, being exactly opposite to another state in which the patient feels "unusually bright and active, mentally and physically," for some time before the fit, to be plunged into painful dejection after it is over.

H. N. Moyer* reports the case of a young man of good family history, and correct personal habits until the age of fifteen years, when he became an alcoholic. At nineteen he was nervous, and had hallucinations during his waking hours—seeing strangely formed animals approach him several times. In 1895 he became afflicted with a tendency to sleep, so that he had frequently to lie down several times a day for the purpose—20 to 50—the patient himself states, sleeping only a few moments each time.

While running an elevator he would sleep while passing several floors. He had other attacks which he described and which differed from the ordinary sleeping attacks. "Once at the table he suddenly became unconscious, the attack probably being epileptic."

It is difficult to say to what extent, if at all, these attacks of somnolence may have preceded the lighter forms of psychical epileptic convulsions, but it seems probable that toward the last, at any rate, they must have been most intimately associated with the epileptic state. Complete obscurity at present surrounds the cause of these conditions. Clinically, the first appears to re-

* Epilepsy, p. 257.

* Medical Record, Nov. 19, 1899.

semble somewhat the so-called sleeping sickness that has been prevalent of late years in certain portions of Central Africa, and which investigators of the London School of Tropical Medicine seem to think is due to a low form of chronic meningitis. In this disease death invariably follows, which is not the case in the somnolent forms of epilepsy, *i.e.*, somnolent through the prodromal period only; the patient being as bright and as well as ever after the effects of the convulsion are over.

In rare instances the heart is the seat of disturbance that indicates an approaching attack, some pain, but more particularly a "feeling of distress" being felt in the cardiac region, palpitation being comparatively common.

When cephalic sensations are experienced, they are generally dependent upon the extension of an aura that had its origin in some other part of the body, like the stomach, though there is occasionally a sense of "fulness," or "a rushing sensation," experienced in the head or throat, altogether independent of any disturbance anywhere else.

In conclusion, my experience leads me to believe that the more sudden, severe and complete the epileptic attack, the less likely it is to be preceded by an aura, while the further the convulsion departs from the classical type, the more common and distinct the aura; and while at present we make but little use of these important initial manifestations of the epileptic state, they justify close and analytic study as contributing possible guides to the seat of the disease.

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## THE DAILY RHYTHM OF EPILEPSY AND ITS INTERPRETATION.

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THAT all force has a tendency to assume a rhythm is a fundamental postulate of physics (Spencer). Disease rhythm or periodic variations in the symptoms of general disorders has been an important factor in diagnosis and prognosis for many years. Some sort of rhythm attends all nervous processes both normal and morbid. This is a fact well proven by biological and psychological experimentation. Disease rhythm (not of muscle movements) in the chronic convulsive disorders is perhaps the most noticeable. This is particularly in evidence in the single or multiple tics, choreas, myoclonies and paralysis agitans. Their rhythmic variation are usually designated "good" and "bad" days. All forms of the insanities have well-recognized clinical stages of remission and exacerbation. As the pathology in the convulsive affections approaches nearly an organic basis in which parenchymatous and interstitial changes play the chief rôle, we must seek their principle of pathogenesis in an initial toxin or autointoxication. The rhythm of the pathogenesis must also be present and consequently fresh opportunities should be at hand for physiological chemists to grapple anew the many serum problems connected therewith.

The tempting field of wider amplitude of rhythm in the epilepsies as shown in the seasonal, menstrual in women and general meteorological variations, will not be considered here, but remarks will be limited to an exposition of the daily rhythm and its interpretations.

In 1897 (*Medical Record*, April 17) I collected and tabulated 9,545 epileptic seizures by hours for the purpose of determining the existence or not of a definite curve. In the compilation the early morning hour, four o'clock, appeared the greatest hour of frequency. The study quite contradicted the conclusions of Féré in a collection of 1,938 seizures from which he inferred that the eleventh hour was the period of least frequency; in mine, the hour before noon was the sixth in order of frequency. For this and other obvious reasons I determined to review all the data procurable and study the subject at great length. During the next four years I carefully collected data from epileptics of both sexes in three different groups comprising those of varying types of the disease who lived under dissimilar conditions and who were engaged in different pursuits. All the cases from which data was collected were under my immediate care and attention at the Craig Colony for Epileptics, at Sonyea, Livingston Co., N. Y. The sum total of the study comprises 150,000 epileptic seizures. The general manner of life at Sonyea has been excellently detailed by Drs. Peterson and Spratling at various times and need not be dwelt upon at length here. Suffice it to say that it is a country life adapted to the semi-invalidism of the epileptic class under hygienic regulations and control as regards occupation, diet, baths and medical treatment. Lest sedation might be considered as a hindering factor in the study with its well-known tendency to modify the rhythm in individual cases, I may say that the bromide treatment was at the minimum during a large part of the study, and in group three it was practically nil throughout the entire collecting period.

TABLE I.

TABLE I.—An hourly analysis of 5,677 attacks occurring in about 25 epileptic men and women for a period of 18 months in the Peterson Hospital. Severe type of epilepsy.

Table I includes all attacks which occurred in the Colony Hospital for a period of eighteen months. A total of 5,677 seizures in an average number of 25 patients equally divided between two sexes. Serial and status periods are comprised herein, and it can be positively stated that every seizure of the twenty-four hours was cer-

tain of record, a fact of no mean importance and often overlooked in the heterogeneous collection of such data from private and unreliable sources. The character of the cases in the hospital was representative of the colony at large. All forms of epilepsy were shown. The character of the diet and hours of meals (7 o'clock A.M.; 12 noon; and 6 P.M.) varied but little from the institution proper, and consisted of light breakfast of cereals with weak coffee and bread and butter; dinner of soup, meat, vegetables and plain pudding; supper of bread and butter, stewed fruit, milk or weak tea.

The great majority of the patients were bed cases and the hours of sleep were from 8 P.M. to 6:30 A.M. The life for those not in bed was largely sedentary and unemployed; a few indulged in open air exercise. The data of this record would have been quite ideal for statistical study if no more serial or status periods were embraced in it than that chargeable proportionately to 25 patients, but every severe case of serial epilepsy and status epilepticus occurring at the colony is sent to the hospital for treatment. However, this data may form a legitimate part of the whole picture. In considering curves or maxima periods of frequency, we find three fairly distinct exacerbations ranging themselves: that of the early night or 9 P.M.; that of 4 A.M. or early morning; that of noon or 12 P.M. A tendency to the formation of smaller or secondary curves at 9 A.M. and 4 or 5 P.M. may here be noticed also.

TABLE 2.

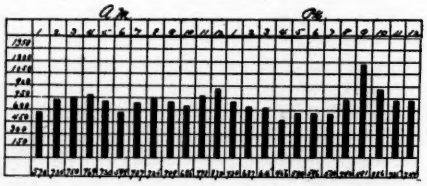

TABLE II.—An hourly analysis of 16,762 attacks occurring in about 40 epileptic men and women for a period of 3 years in mild type of epilepsy; the Letchworth House.

Table II is composed of 16,762 attacks occurring in about 40 men and women, equally divided, for a period of three years. The grade of cases were from the middle class of epileptics. The men were largely out-of-door workers on the Colony farm, and were of about the grade of those usually so employed at farm labor. The maxima periods appear similar to that in Table I, at early evening or 9 o'clock P.M., at noon, and early morning or 4 o'clock A.M. The more marked tendency to the formation of secondary curves in the early morning at 8 or 9 A.M. and in the late afternoon at 4 or 5 o'clock P.M. is also quite apparent in this chart.

Table III is made up of 18,494 attacks occurring in the idiotic, imbecile and demented male epileptics. They have no occupation and the life

TABLE 3.

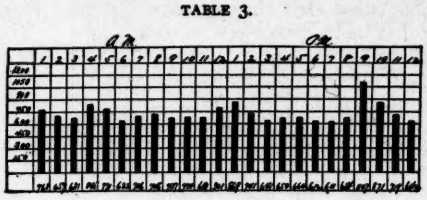

TABLE III.—An hourly analysis of 18,494 attacks occurring in 70 feeble-minded and demented epileptic men for a period of 18 months; West House Group. Severe type of epilepsy.

is a sedentary one. The maxima are similar to the preceding tables.

Table IV is a grand total of the different groups here given with a further accession of 110,067 seizures collected impartially from all the groups, thus making a sum total of 150,000 seizures.

A chart of about 40,000 seizures compiled from the women's group exclusively, was discarded as its accuracy was seriously in question. It was, therefore, not used as data in the sum total. I have no reason to doubt but that if it had been carefully compiled it would have presented the same general characteristics as that of those already given.

In Table IV the same general curve or maxima periods are present as in the preceding component tables. The hours or period of greatest frequency is that of the early evening or 9 P.M., and secondly, that of 12 o'clock noon to 2 P.M., and thirdly, that of 4 to 6 o'clock in the early morning. It is much less misleading to speak of the maxima as grouping themselves at a particular period rather than at a particular hour. If this be done we shall find that all the tables practically agree. The secondary curves become still more prominent in this last chart. The attacks are

TABLE 4.

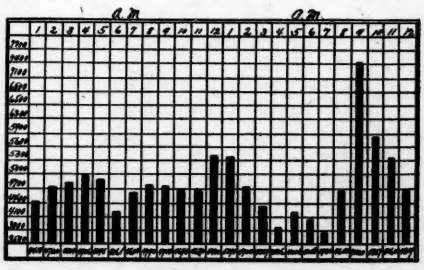

TABLE IV.—An hourly analysis of 150,000 epileptic seizures comprising the three preceding tables with the addition of 110,067 from all three groups.

quite evenly divided between day and night. It may, therefore, be stated that there does exist well-marked and fairly definite periods or rhythm in epilepsy. It is divided approximately into eight-hour periods with tendencies to the formation of secondary rhythm about midway between.

The maxima periods in their order of frequency are in the early part of the night, in the middle of the day and in the early morning.

I submit in explanation of the daily rhythm in epilepsy that we must consider in the first place the auto-intoxication, just as we regard the predisposition to epilepsy in general so must the auto-intoxication be reckoned with in the interpretation of the daily variation; in the second place, as the exciting agent or rather as a permitting factor of a negative sort, stands the lowered inhibitory control supposed to be a general function of the cerebral cortex in its totality.*

The lessened inhibitory control is expressed particularly in the degree of depth of sleep. In point of fact the seizure curve at night may be taken as an inverted curve for blood-pressure, depth of sleep and cerebral inhibition. Probably the diminished blood-pressure and the cerebral anemia supposed to occur in deep sleep are coincident and contributing factors to the sleep state.

Sleep, which is the diastolic phase of cerebral activity, is deepest in normal individuals the first hour or one and three-quarters hours (Minninghoff and Preisbergen) after retiring; it deepens at first quickly, then more slowly; it then lightens and remains indefinitely light; an hour before waking it is very light, nearly as light as the first part of the night. There is a final deepening but of course not so marked as that seen in the first sleep at retiring. Sleeping deeply implies literally sleeping down through all the level or neuron orders. In deepest sleep I have never been able to obtain knee-jerks and plantar responses except by such severe stimuli as to awaken the patient. In the reverse process of awaking the lower reflexes are released first and may on stimulation be made to overact. This is in brief an epitome of our present knowledge of the sleep state and the reflexes.

Physiological and morbid crises occur frequently in the light sleep periods such as nightmare, night terrors, nocturnal emissions, somnambulism and epileptic seizures. The fact that the individual passes into deep sleep rapidly on first retiring discourages the occurrence of the crises just mentioned, nevertheless I found in extended observation upon certain cases where deep sleep does not quickly occur and where it remains indefinitely light in the early retiring period that epileptic crises of varying degree of severity and frequency occur. The return to light sleep after the first period of deep sleep is comparatively speaking gradual and consequently permits the occurrence of the highly organized cerebral reflex process of epileptic seizures. However light the sleep the cerebrum which is the seat of the general function of inhibition is in abeyance and in result permits all reflexes (literally not asleep) to run riot. This theory explains also the early morning frequency.

It must be distinctly understood that the negative state of cerebral inhibition in the light sleep periods does not cause anything, much less the occurrence of epileptic seizures, but permits their occurrence by letting go of the normally inhibited lower reflexes. Epileptic seizures are a sensory-motor reflex, comparatively high grade in character as they are functions of the cerebrum itself. The auto-intoxication must be the active agent in its excitation. I cannot but believe that the modifications in the condition of blood-pressure cardiac and respiratory activity, body temperature and secretory variations are but coincident factors to the sleep state and dependent upon it rather than the reverse. They all may and probably do contribute their share in the general occurrence of the climax of auto-intoxication.

The explanation to the noon frequency is more difficult than the night rhythm, as in the latter case the external conditions are largely at a minimum. However the noon frequency may be explained as follows: The patient is fatigued and inactive for the first time since awakening. This inactive period may properly be termed day sleep; it is a time of day dreams and is quite comparable to the light sleep during the night. Then, too, this period, 12 to 2 o'clock P.M., is the time of ingestion of the heaviest meal of the day. Epileptics have a well-known tendency to eat hurriedly and to bolt their food. The fact that the food is not properly masticated is a great fault, but in addition bolting and eating hurriedly makes the act of swallowing frequent, and this act is a well-known source of exciting an epileptic seizure. The factor of overeating must not be overlooked in explaining the frequency of seizures at the time. The excessive degree of auto-intoxication at this period more than compensates the moderate degree of cortical inhibition still present and not in evidence in the early morning hour period.

The hour before retiring is the period of least frequency (7 P.M.), and this is quite in accord with the well-established physiological law of "good feelings" at this time and particularly the inhibitory control shown in the insane in which, on the eve of recovery, the first lucid periods occur at the hour before retiring (Clouston). The application of sedatives at the periods of greater hourly frequency invariably causes a false period to be established if sedatives alone are employed. In addition to the bromides the treatment must be to eliminate and subdue the initial causation.

Epileptics do not meet with serious accident while earnestly occupied, or, at least, not until such occupation becomes unconscious or largely automatic in character. That idleness and indifferent occupations are to be discouraged for epileptics is well known; work should be simple in character but not monotonous.

Epileptics rarely need hypnotics but are nevertheless light sleepers especially when not under great sedation. They are subject to frequent disorders of sleep and particularly liable to be great dreamers, an index to the soundness of sleep. Chloral and its allies owe their beneficial effects

* Probably, for many reasons this function is in the possession of the second layer type of cells, so-called sensory layer.

in the nocturnal types of the disease more to a hypnotic effect than as a cardiac and vascular depressant. The bromides, the exact action of which in the epilepsies is not known, however, we know they diminish the afferent impulses to the motor cells in the cortex and therefore aid inhibition.

To recognize the existence in general terms of a daily rhythm in epilepsy is of practical importance for obvious reasons, and especially to those with whom the care is immediately entrusted; particularly for guarding against accidents and injuries at those periods of greatest liability for attacks. This suggestion has most value for epileptics without known periods of liability to attacks. The agents that are employed to arrest or delay attacks are as much of our common experience as are their general inutility when indiscriminately used even when a sufficiently prolonged aura presents itself. We must, therefore, continue to insist upon a broad, comprehensive, carefully detailed, continuous plan of treatment, however empirical at present it may seem to be.

To summarize.—This study of 150,000 seizures shows that there is a more or less definite daily rhythm in the epilepsies, in the early evening, noontime, and in the early morning, which roughly divides the 24 hours of the day into eight-hour periods. There are also smaller or secondary rhythms.

The interpretation of the rhythm is explained on the basis of cerebral fatigue and the accumulation of waste products at these periods which produce auto-intoxication and which in turn exhibits itself in seizures during light sleep and during the day when the loss of cerebral inhibition is greatest. Secondary and contributing factors are: manner of living, diet, exercise, occupation, sedatives and the character of the epilepsy.

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## ON THE PATHOLOGY OF EPILEPSY.

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ALL our knowledge of human reactions, and so far as that goes, of practically all biological reactions, is symbolic and relative. We can study various types of reactions and learn to distinguish them, and find the conditions under which the reactions take definite forms; but we cannot understand them as we understand the striking of a clock. We can learn to build a clock and to see how point by point, wheel by wheel, the parts are brought into connection and that the work of a spring and perhaps the regulation by a pendulum bring about the definite result. In biological observation the data of organization remain an ever-puzzling question. Experience of physics and of chemistry furnish the material for *analogies;* perhaps they actually explain certain components of the whole reaction, as the theory of statics and mechanics explain the working of the joints. But behind it all we see that the entire equation is made up of many unknown factors, among which the known principles play a very modest part. This is natural enough. All knowledge is the result of analysis and rearrangement of experience and our theoretical sciences are made up of what is most easily analyzed and compounded again in experiment, and that mostly on materials which are used for technical purposes. As soon as we leave physics and chemistry and step into biology, many x's and y's of our equations become irreducible and all attempts to ignore this and even to make electricity or the more modern theories of osmotic pressure, or the yet more modern combination of the two a panacea of explanation of biological facts, leave something like a bad taste of unripe fruit.

We can, of course, make absolutely correct calculations even if we assume the living being to be an unknown but definite quantity and introduce into the equation merely such factors as are actually understood in their relation to the rest of the total being and its manifestations. The usual blunder is that we put some physical or chemical factor into the equation without considering that we really invade and change the first which is no longer quite identical with the biological entity without the reaction which we single out. Thus we hear uric acid spoken of in relation to epilepsy almost as if it did not belong naturally to our economy, and as if we knew all about it in a large number of people.

Of all calculations in pathology, those on epilepsy have proved most elusive. Its chief manifestation, the convulsion and its equivalents, is as puzzling to the physician as it is fear-inspiring to the layman. Theories of its nature have been attempted and we have many names for them. The fact is that it is as little open to an absolute understanding as any other, even the simplest, "spontaneous" motion. We must take it just as one of the *types* of puzzles of largely spontaneous motion and be contented with establishing as far as possible, the conditions under which it occurs. In this respect, there is indeed a great deal that is worth knowing.

The first fact is that it is possible to recognize many types of manifestation of this kind of puzzle, and that some types belong more closely together, so as to form distinct natural groups with definite conditions. Thus ordinary observation allows us to distinguish epileptiform conditions from so-called idiopathic epilepsy; but distinctive marks which would point to the special origin of the type are often enough absent. If we had time for a broad review we should have to draw into our scope of analysis: subagonal twitchings, especially of animals; the convulsions of children, called eclampsia; the results of mechanical or electric excitation of the nervous system, which vary in the different animal species. A special type can be produced in the guinea-pig and in these according to some observations is even directly transferred to the young; temporary convulsions are variously produced in higher mam-

mals; differences depend in part on the architecture of the nervous system of each species; in line with these we mention the focal irritations by special lesions in the brain of man, either focalized as in trauma or tumor, or more diffuse, as in general paralysis, etc. Next we have the group of toxic convulsions (alcohol, absinth, ammonia, uremia, and diabetes). Further, the convulsions in hysteria and in catatonia, in part of psychic origin. There is finally left a large group, not further analyzed, the idiopathic epilepsies.

We see from this that convulsions are a very common form of neural action. Its study as a neural action is a dry field, but all the more important for the discovery of distinctive diagnostic types. The description of these facts properly belong to the clinician. Important positive and negative facts are brought forth by the autopsies, mostly in the direction of localization of so-called provoking lesions, or showing what we must consider effects of epilepsy, or pointing to special constitutional peculiarities. A combination of the clinical facts and the anatomical evidence together is needed to form the material for a pathological consideration, for a digest and if possible experimental investigation of the nature of the disorder and the conditions in which it appears.

Owing to what seems to me, a short-sighted way of looking at the facts, the evidence from the autopsies is looked upon as more than manifestations of the disease, as directly demonstrative of the nature of the disease. Yet nowhere more than in epilepsy do we find the need of a more modest sizing up of the anatomical facts. They are not any more nor less "pathology" than the other manifestations of the disease, usually called symptoms. They are morphological symptoms and in order that we shall get at the nature of the disease, they must be classed with the symptoms for what they happen to be worth, and the deductions must come from cautious elaboration of all the facts, if possible with experimental proof of the conclusions.

As a concession to the current manner of division, I briefly state what morphological facts we have: In a large number of cases there are lesions in the nervous system. Among these many of those of the cerebral cortex are most probably points from which the "discharge" begins, so-called provoking lesions, many of which can be diagnosed in life. There are, however, cases of so-called idiopathic epilepsy in which such provoking lesions are found only post-mortem, so that any cautious observer will refrain from supposing that during life it is possible to distinguish all the cases with a provoking lesion from others which would be idiopathic, unless one has a very accurate history. By far the largest number of findings are, however, more probably incidental, not directly provoking lesions, or at least not primary.

From my autopsies[1] I mention as provoking lesions which were not diagnosed during life: a case with a pea-sized calcareous nodule in the pia of the Sylvian fossa, probably a residual of a tubercle; and a case of moderate hemiatrophy of the brain; further two cases of senile epilepsy with very small cortical foci of softening. More usually the primary lesion was diagnosed and accounted for by the early history of the patient, as in a number of cases of infantile hemiplegia and traumatic epilepsy.

Besides what might thus be called primary lesion—a disorder existing before epilepsy broke out or with which epilepsy came on—there are frequently small foci of softening in the temporal lobes, sclerosis of the cornu ammonis, an occasional glioma of the temporal or occipital lobe, remnants of contusions of the pia, and not infrequently fresh ecchymoses around the temporal lobes, after a status epilepticus, *i.e.*, effects of the frequently violent falls and the like. The rôle of the sclerosis of the cornu ammonis is not easy to decide; but there is no doubt that it also occurs with general paralytics with severe attacks,[2] and rather too often in epileptics who have other certainly primary provoking lesions. Summing up the facts about coarse lesions, we must admit that we know of no lesion which inevitably causes epilepsy; nor of any sufficient reason why the one lesion should and another should not, except that lesions which imply frequent irritation are most apt to be epileptogenous, especially adhesions of the convexity.

Histological findings of the brain yield little that could be called causative. The occasional gliosis of the cortex discovered by Chaslin and Bleuler, and corroborated in some cases by Alzheimer,[3] Weber[4] and others, and the nuclear changes shown by Bevan Lewis, are not explicable, except as a secondary condition. Summing up the general pathological evidence furnished by anatomy and histology of the nervous system, we find that in a certain number of cases we may say that the patient had a sufficient morphological cause for epileptic attacks of the nature of a provoking lesion, and that in some cases dementia is accounted for by gliosis or secondary lesions. But in no case can we say that the patient must have had epilepsy, or with more than some probability what the attacks were and how often they appeared and with what influence on the mental and physical conditions.

Post-mortem evidence of a very interesting character and probably coming rather nearer what is needed for the explanation of the epileptic constitution, is furnished by Ohlmacher.[5] His finding of a persistent thymus and of the lymphatic constitution cannot be accidental, but are difficult to assimilate directly with an explanation of epilepsy as a whole. It would suggest the eminently constitutional character of epilepsy. The lymphatic constitution as such remains to be explained, as well as rachitis which Ohlmacher makes responsible. We further refer to the frequent recurrence of the statement that the large blood-vessels were found abnormally small.

From the observation of patients during life, a wealth of facts awaits digestion: The evidence of constitutional peculiarities and their explana-

tion including especially functional traits, such as Sommer's[6] interesting demonstration of characteristic tremor-curves even between the intervals, the many types of convulsions and equivalents, including irritative, inhibitory and paralytic symptoms, the manifestations of metabolism, and the condition of the blood and urine, and the peculiar reactions to dietetics, therapeutics and other more or less experimental influences such as serum therapy.

If we understand by pathology the digestion of all the facts of observation, clinical and post-mortem, and the further analysis and, if possible, the demonstration of the correctness of the inferences by experiment, we can naturally not attempt a summary in ten minutes; but I wish to point to some of the researches of the last five years, which are most fundamental, and if not explanatory of epilepsy, as such, marking a progress in our knowledge of the mechanisms involved.

1. The neurological side. Prus[7] shows that cocainization of the cortex makes fits by electrical stimulation impossible, so that he concludes the stimulation of sensory elements of the cortex is essential to start any fit. He also furnishes what seems to be a key to the many discrepancies in the experimental study of the fit in animals. He points to many irregularities in the irradiation of the discharge over the cortex and shows that not the pyramidal tracts, but the tegmental motor paths are the carriers of the impulses from the cortex to the segmental nerve-complexes.

This is one of the facts which is bound to change our schematic views concerning the pyramidal tract and make intelligible the claim that the tonic spasm of epilepsy is produced from irritation of the tegmentum of the midbrain and pons; evidently v. Monakow's tract is involved, and the whole mechanism to which it belongs.

But even with this elucidation, we are not carried beyond the long recognized conception of Nothnagel and others that only in a small number of cases is there a sufficient cause for the attacks themselves (as after injection of absynthe or in uremia or diabetes, or after deep faradic stimulation), and that for the ordinary epilepsy with or without a provoking lesion, we must accept a special disposition for convulsive discharges, very general in infants, but more limited to the epileptic in the adult.

The idea of Kocher that the epileptic attack is due to intracranial pressure is refuted by Bier,[8] who did not produce fits by sudden increase of the pressure by temporary strangulation, even of epileptics.

2. The second line of research is that of the relation of metabolism and fits.

This is the line to which most attention has been paid during the last few years. I do not belong to those who consider optimism about pathological chemistry and its prospects in general pathology necessarily premature. But I am equally sure that by far the larger part of chemical research concerning epilepsy operates with very small safe substance in a very large equation full of unknown quantities. And the worst of it is that the methods available seem to be open to so many errors. The literature is unbearably tiresome and contradictory and the results far from encouraging. There is hardly a substance in the urine which has not been made the beast of burden of the great puzzle of the sacred disease. Remarkable constituents have been isolated and in one especially advertised instance they were ultimately found to be simple ammonia; dietetics have been invented by the dozen, animals have been injected with doubtful substances by the hundreds; and it would seem that the more work there is, the more confusion. Wherever I turn to conscientious physiological chemists, I meet with reserve and frank admissions of ignorance, and frequently with much evidence which goes against the justification of the methods used.

With all these reserves, I consider research in this line worth undertaking, even if it were merely to get the puzzle out of the way. The following summary gives some idea of the type of work. Most of the investigations are one-sided. Matters which to one writer seem all important are found not to be considered at all by others who again extol their own hobby. The reason for it all is that the work involved for a complete quantitative estimate of metabolism goes beyond the amount of work which the dilettante can give; and if anything fundamental is to be gained, it must be put into the hands of sufficiently equipped research stations.

Most of the investigations turn around the nineteenth and twentieth century editions of humoral pathology, the theory of autointoxication. We may classify the studies into those with chemical analyses, and those of simple toxicity, and finally those of the possible production of antitoxins.

The numerous experiments of toxicity by the French and Haig's claim that uric acid is retained, gets into the blood and produces the attack and is then eliminated in larger quantities, prompted Krainsky[9] to study the metabolism of a number of epileptics. He found that when the daily amount of uric acid is 0.6 to 0.8 grams, there is no attack, but a fall below 0.45 is usually followed by an attack. Means favoring the excretion of the uric acid have, however, no influence. The amount "retained" is usually made up for after the attack. Couvreur[10] found some such relation in only four out of ten cases. The diminution may be noticed three to five days before the attack, but the amount may sink below 0.4 or even 0.35 without a fit, or fits may come on without a diminution below 0.4. If the deficiency is made up for at all, it usually takes several days. Caro[11] corroborates Krainsky's findings in his case, while Putnam and Pfaff[12] did not in their two cases.

Apart from the curve of uric acid and phosphorus Krainsky saw no regular correlation with the disease-curve. Galante[13] found, however, a regular appearance of 0.05 to 2 per cent. of albumin after the fits and a parallelism of this albumin with amounts of indican.

The chief hold for the autotoxic theory was

the experiment with injection of blood and serum from epileptics. Krainsky had positive results on rabbits and incriminated carbamic acid. Binswanger failed, and since then the majority of the conscientious experiments of Herter,[14] Roncoroni,[15] and Bratz and Hebold[16] have discredited the early claims of the French writers. Bratz and Hebold even made their injections on animals from alcoholized parents and on a dog with a brain-lesion without any typical result.

Concerning the toxicity of urine we can practically say that the injection test is as contradictory as it is of doubtful bearing. We know how difficult it is in man to establish satisfactorily the mode of death and how many precautions are necessary. In the animals of which we read the report of death after injections, there is hardly an intimation of an effort at a careful autopsy, and no sufficient evidence for the nature of the influence of the injected material.

It would seem quite fair to-day to say: With the attacks of epilepsy go expressions of an abnormal state of equilibrium, evidenced by malaise and abnormal metabolism. Auto-intoxication is not demonstrated. The facts taken for evidence of autointoxication are not linked in a convincing causal chain. The explanation of the occasional toxicity of urine and blood for animals is still wanting, and the occurrence altogether too irregular. It is suggested that it might be as well the mere expression of the condition during and after the attack and not the cause.

This negative attitude may be surprising in the face of the assurance of the latest phase of research on epilepsy represented by Bra[17] (who has found his neurococcus before and during the attacks of epileptics and has produced convulsions and death in status epilepticus in rabbits by the subcutaneous injection of the cultures), and the enticing communication of Ceni,[18] which is probably all the more fascinating because it seems to give therapeutic promises. Injections of serum from epileptics have been found by him to reduce the number of attacks in six cases, to cure two relatively recent cases, while two cases got worse. His theories, which are merely a transcription of his empirical results—are easily accessible and require no repetition here. Time will show how they will rank in the light of longer series of observation.

Somehow all therapeutic procedures in epilepsy have demonstrated a remarkable psychic factor, which always bring to my mind the experience of Dr. T. H. Gage, in Worcester, who, after his fifty years' connection with the two hospitals for the insane, has given me some very interesting accounts of the temporary influence of optimism on the part of physician and patient in various waves of new treatment in epilepsy.

We can say now that epilepsy is a disease about which there is a large material of safe empirical facts. Their use has led to a remarkable improvement of the condition of epileptics and their management, and if we wish to properly observe everything that is empirically established, and a guide for action, there are even now good chances for better utilization of what we know.

From an explanatory point of view, pathology, or scientific medicine, has added little and it does not seem to give much immediate promise. The factors, the remote etiology and the constitutional proclivity to epileptic discharges, are not very accessible to the young sciences. It is all the more necessary to lay a good foundation of carefully collected empirical facts to give a good balance to what scientific research is undertaken. I cannot suppress a feeling of self-reproach which ought to be of some use to those who direct the management of epileptics. Epilepsy is a huge field and requires an excellent system for conscientious and exhaustive observation. In my crowded clinical work, the epileptics have rarely found that exhaustive attention which they ought to get. Even in the autopsies where hurry is not the rule, I must have overlooked many things to judge of the percentages shown by men who were looking out for points of special interest to them. This makes me inclined to think that momentary interests are likely to make observation one-sided and surely put the patient at a disadvantage. Only a very systematic arrangement of the work will avoid this. With this in view I conclude.

1. The frequency of nervous lesions in epileptics is difficult to establish. The ordinary examination is too open to oversights, and must be very systematic in order to justify the verdict of negative findings. The great variation in the number of sclerosed cornu ammonis, diffuse gliosis, small foci of softening quoted by various authors, is certainly to a large extent an expression of variable attention, a picture of the psychology of investigators rather than of the distribution of facts.

2. Concerning the chemical investigations, the same psychological factor of personal interest is even more deleterious to a fair comprehension of the facts. The truism that observation of the rules of hygiene in every direction is a great factor in the management of epilepsy, is decomposed into innumerable currents of interests. Nothing short of unprejudiced and complete series of investigation will help us here, and also a much greater conservatism with complicated methods such as the tests of toxicity, the results of therapeutics, etc.

3. All these conditions are difficult to attain except in sufficiently equipped institutions for which funds should be made available by the State, and by scientific corporations, so that they may work free of the need of sensational results, create a sound basis in clinical work and systematize the investigation according to methods which can be admitted as safe and fruitful.

To what extent this had best be carried, is a question requiring much judgment. The one thing is certain—and every move in this direction should receive credit and encouragement—that institutions should be given a chance and should even be put under the obligation of doing justice to medical observation, of promoting the medical

interests of its physicians and of laying a good foundation of experience, such as the isolated practitioner can never get for himself. On such ground, more delicate investigations will find a healthy soil.

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## THE LEGAL AND SOCIAL STANDING OF THE EPILEPTIC.

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AVOIDED by man and seemingly forgotten of God, the epileptic of all humanity is the most pitiable and the least pitied. Periodically beyond self care, often dependent upon his fellows for the preservation of his body, ever haunted by the awful doom that blights his very soul, he cannot see even a silver fringe to the cloud that obscures his life. Yet we of the law ignore him, letting him pine in prison or perish on the gallows; we of the pulpit draw our cloth closely to avoid contact in passing him; and worst of all, we men of medicine gaze a moment then turn away muttering, "hopeless, disagreeable to handle." Surely fate has done its worst when it casts the net of "falling sickness" upon mortal whether man or beast. It is our simple humanitarian duty to loosen the knots of that net.

The conditions we face are these: (1) Legally the epileptic is held rigidly responsible unless by rare change he proves irresponsibility at the specific time; (2) socially he is held to hard and fast responsibility, consequently ostracized; (3) the few who have studied him intimately know that morally he is practically always irresponsible.

Now let us see what the law has done toward lightening his burden of existence. In the Eastern States of our Union he has been studied and his condition is beginning to be somewhat understood and occasionally allowance is made for him in courts of justice in arriving at an equation of moral right and wrong. We say occasionally, advisedly, for the mental aberration must be self evident, else the unhappy victim becomes yet further accursed as a social scapegoat. Very often even here in our learned East does the law see the criminal in mirage where the patient exists in reality. In the West and South more haste and less justice is seen. There the lunatic sometimes gets deserts; the epileptic rarely if ever. It takes wealth with its settled conditions of learning and culture to make liberality; further there must be a high average of intelligence to be liberalized, else wealth itself will prove impotent. In the hurried civilization of the West, and in the South with its generation of social revolution, added to its terrible incubus of negroes, the quiet deliberate justice of the East is yet impossible. Hence the greater responsibility rests upon the East in experimenting, trying and weighing till basic conditions are reached and precedents set.

What a blot the present status is on our civilization. We think of our fathers as inhuman for stoning the leper, our children will think of us as cruel and point to our dealings with the defective, especially the epileptics, as an example of man's inhumanity to man. Only two States in all this land of lavish liberality and boasted enlightenment offer sanctuaries for the refuge of the most helpless, hopeless and unhappy of their defective children. All other States say in effect, "become either a criminal or a lunatic and then I'll cheerfully assume your burdens, but as a helpless, hopeless epileptic I'm not concerning myself about you. I'm not trying to save you while there is yet chance of making you an economic factor, however willing I may be to preserve you as a social ulcer." Is there in all this realm a harder fate or a fate more hardly dealt with?

When that lowly priest in the valley of the Rhine offered himself to be the Moses of this most benighted section of humanity he put to blush the charitable world and soon had blazed the way for the truest benefactory legislation ever graved on statute books. He and his flock have treaded a path, tortuous and stony in places it is true, to the elysian field of comparative contentment. And the sight of those anxious social outcasts crowding to his hearthstone and tapping at the door of his heart crying "Save me ere I sink," makes one of the most pathetic chapters in all the history of suffering humanity. At his fireside they found warmth, and in his heart they found devotion in such generous measures that their frozen natures were warmed till they became all but happy. Not happy, no, for Jove in anger at the murder of Iphitus swore that neither Hercules nor any of his epileptic ilk should ever reach that. Mentally astigmatic, spiritually strabismic, the clear straight rays of happiness are for him distorted.

Even after Bielefeld had thrown its enlightening rays on the world for nearly a generation, Ohio as a pioneer took cognizance of the epileptic not as such but as a lunatic, and founded a separate asylum not as much for his care and his pleasure as for the *comfort of the other lunatics.* Think of it, because the insane epileptic was an unpleas-

ant associate for the maniac was he segregated! Nevertheless he became the recipient of a disguised blessing, for the action of Ohio put alienists and neurologists to watching and thinking, culminating in the genius-like flash, that brilliant patch of sunlight, Sonyea.

When New York State founded for sane epileptics Craig Colony from the public treasury, and maintained it by public taxes, the millennium of charitable legislation seemed nigh at hand. There the epileptic and not the lunatic is cherished and studied and remodeled for a scientific problem.

As a result of all this awakening we will ere long see the scales of justice balance even with an epileptic in one pan. It will not rest then with indifferent juries, but the expert guided by definite standards will say when justice is satisfied.

But as yet we are many, many rounds beneath that supreme height, and frankly stated our standing ground to-day is this: New York and Massachusetts, only, recognize the helplessness of the epileptic and extend to him an official hand ere he sinks hopelessly into insanity. Among nearly all other peoples he is simply a disagreeable person, a crank, a pauper, a lunatic or a criminal as circumstances seem to indicate. He is a veritable briar in the social rose garden, an incubus on his friends, a blight on his family, a burden to the community, an annoyance in hospital or asylum, a black beast in prison. No wonder he is such a nightmare in the courts of justice. And doubly strange it is that no real scientific and concerted action to bring order out of chaos has been taken by our medical fraternity. Why is it that precedents have not been established for future guidance?

An epileptic who commits crime should be deprived of liberty during the continuance of his disease, but he should very rarely, if ever, have the stamp of convict placed upon him, for the convict should be a criminal by intention, while the epileptic should be presumed to be irresponsible, therefore incapable of criminal intention till clearly proved otherwise. As the law by omission, and practice by custom, now stand he is presumed to be responsible till proven not epileptic but insane. How unjust, for while the epileptic state lasts it constitutes one of the very worst types of mental unbalance but being often of short duration with clear intervals between attacks the public and the bar, yes, and often the court, fail to grasp the idea of periodic actual mental irresponsibility. In the eyes of the law this means inability to distinguish right from wrong at the time of examination or trial and not often at the moment of the overt act. The test of mental irresponsibility really ought to be not the faculty of distinguishing right from wrong, but the power of resisting wrong as opposed to right. We know that the epileptic may be totally vacuous mentally this minute and markedly alert the next. That statement is patent to those who have studied him intimately, but apparently incomprehensible to those who have thought nothing of the problem.

It is indeed a hard fate that the epileptic must suffer all the damage of the insane, bear the cross and show the hall marks of insanity, and yet wear the convict's stripes. But such is the fact to-day. The next generation will see that changed. The law will require their segregation, but not convict imprisonment.

Black as the legal status has been painted, yet darker coloring is needed for the finishing of the social picture. Ostracized becomes a light word, outcast but little worse, despised is more fitting. The family hides him from the world, keeping this awful skeleton well closeted, and where possible leaves him to the tender mercies of hirelings.

The epileptic as a rule is not an attractive personality, usually wearing in face and figure, in the very atmosphere about him the trade-mark of the most unfortunate. Careless in speech, prone to exaggerate, illogical in conversation, irritable in controversy, erratic in ideas, he makes an all round disagreeable comrade. Suspicious, improvident, forgetful of the past, indifferent to the present, careless of the future, he makes an utterly undesirable friend. As the preacher's protégé he causes the ministerial heart strings to tighten; as a client he provokes his lawyer into losing faith in humanity; as a patient he all but forces his doctor to dislike his calling. Not welcome as a private guest, not wanted in public gatherings, even his own family holds its conferences without him. The confidant of no one, in close companionship with only his own perverted imaginings, no wonder in brooding over his fate he sees the world all against him. Truly the thorn and not the petal of the rose, the burr and not the down of the thistle, go to make his couch.

We ask each other over and over again if there be a remedy for all this? No, the very conditions say there is not. The best we can hope in the reasonable future is amelioration and that will come by segregation in colonies of course. There he can be suitably clothed and fed, humanely treated, and his energies directed into profitable as well as congenial channels, thus minimizing the curse of his disease. The very nature of his disease makes him a social incubus and our efforts should be to lighten the weight of his burden.

His moral irresponsibility is a fact beyond controversy, for his acts are at times purely automatic; nor is this state brought on by his volition. Therefore, it becomes self-evident. Because of the ofttimes similarity between alcoholic and epileptic stupor, the public fails to make the necessary all-important distinction. That difference is this: the inebriate is mentally but not necessarily morally irresponsible in that he voluntarily induced his stupor. The epileptic's stupor is involuntary, hence completely obliterates his moral as well as mental responsibility.

We can place the average epileptic in worldly setting as follows: forbidden socially; unwelcome in court except as criminal or lunatic. Truly this disease puts the porcupine's armor on its unhappy victim. He becomes a veritable noli-me-tangere, neither man nor beast approaching him unscathed.

If Nirvana be a reality, if there be a dreamless sleep with no awakening and rest eternal, let us not begrudge him it, for surely happiness will not come nearer.

In a little corner of this chaotic picture of melancholy figures let us remember to place the sweet placid face of that rarest of individuals, the contented, almost happy epileptic; whether that contentment be a water mark of insanity or whether the heart has been touched by a love higher than human we can never tell. But we all who have dealt much with the epileptic have seen one or more of these pitiable, pitied, lovable and loved characters. I have been told that at Bielefeld and Sonyea one sees many of those faces; if that be true let this Association rest not, nor look backward, till every nation and every State may point to such a place as its chief ornament.

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## THERAPEUTIC SUGGESTIONS IN DIPHTHERIA.

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THE specific treatment of a case infected with diphtheria consists first and foremost in giving it *the required dose of antitoxin.* The dose depends on the severity of the infection. The usual amount required for a very mild case, of a child from one to five years old is 1,500 units. If there is no effect noticeable within twelve to twenty-four hours then the second injection of the same quantity should be repeated. A child five to ten years of age should be given at least 2,000 units at its first injection to be followed in twelve hours by another injection of the same dosage if there is no amelioration of the symptoms.

When we are dealing with a severe toxemia with marked general depression and large pseudomembranes in the throat, then at least 3,000 units of antitoxin should be injected in the beginning. When the cervical lymph glands are enlarged and there is slight or severe evidences of stenosis then at least 3,000 units should be injected in the beginning.

*Indications for a Second and Third Injection of Antitoxin.*—If twenty-four hours after the first injection there is no visible effect on the pseudomembranes, if the child is not brighter, if the appetite is poor and if the heart's action is very poor, in other words if there is no visible improvement, then by all means inject a second dose of antitoxin.

The necessity for the third injection depends upon the pulse, temperature and the condition of the glands of the neck, also upon the macroscopic condition of the throat. If no improvement exists then the third injection is imperative.

*Laryngeal Stenosis.*—It is always a safe plan to give a large injection of 3,000 units and if the stenosis does not disappear in twelve hours, then I give an additional injection of 1,500 units so that in all 4,500 units can be injected during the first twenty-four hours.

The above treatment with antitoxin will be serviceable when we are dealing with a pure Klebs-Loeffler infection, but there are a great many cases in which this is not so.

*There are contributing factors leading to a fatal termination.* First and foremost is the presence of the streptococcus in addition to the Klebs-Loeffler infection. In these mixed infections we have in addition to the general diphtheria, a distinct streptococcemia. In these cases antitoxin is inert as regards the streptococcus. We frequently have bronchopneumonia, nephritis, arthritis, otitis, and local abscesses due to the invasion of the streptococcus. To neutralize such mixed infections we require besides the Klebs-Loeffler antitoxin a streptococcus antitoxin or a potent antistreptococcus serum.

*The bacteriological findings will therefore be the guide in the future in determining, first, whether a culture from the throat shows a mixed or an unmixed infection and in addition to this bacteriological examination, the blood must be examined to determine the presence or absence of a streptococcemia. The treatment must be based on scientific data, hence, it should conform with the result of what is found by culture from the throat and by the thorough examination of the blood.*

If we can inject a sufficient quantity of antitoxin to stimulate cell activity and neutralize general toxemia, then we give our patient the greatest opportunity to eliminate this deadly poison and to begin convalescence.

*The ordinary shortcomings* that are most frequently met with consist of, first, placing too much reliance on the specific nature of antitoxin regardless of other vital necessities. In this infectious disease, where there is marked leucocytosis and other evidences of subnormal hemic conditions, the *indication next to antitoxin is for restorative treatment.*

*Mouth Feeding.*—As a tissue and blood builder *no medication equals food.* It is, therefore, imperative to support the general nutrition by proper feeding. Milk diluted with some cereal decoction, like oatmeal, barley or rice will be better borne than pure milk alone. Sometimes it is necessary to partially peptonize to render it more absorbable. If the child is old enough the yolk of a raw egg can be added to the milk. Concentrated beef broth, chicken broth, clam broth or oyster broth should be thought of. When feeding, once in three hours, it is a good plan to give some of this concentrated broth, followed in three hours by a milk feeding, and so alternate. In this manner we give our patient milk once in six hours. Acid fruits, such as oranges, lemons, grapes and cranberries are very well borne. When acid fruits are ordered they should be given an hour before milk feeding. Older children can be given raw scraped steak, calf's foot jelly, and ice cream which is nutritious and pleasant. When it is *difficult to feed by mouth* owing to excessive vomiting or to anorexia, or where intubation has been performed, then it is a good

plan to let the stomach have absolute rest and to depend on

*Rectal Feeding.*—No more than two ounces should be injected at one time.

Milk, predigested, ..... 1 ounce
Starch water, ..... 1 ounce
Laudanum ..... 1 minim

To be injected slowly through a colon tube, after both colon and rectum have been cleansed by a soap-suds enema.

If the small nutritive enema is well retained then we can repeat the injection once every four hours, and add the yolk of a raw egg to the above formula of milk, starch and opium. Next in importance to giving the proper dose of antitoxin is the nutrition of the body which has just been considered. To assure proper assimilation of food requires attention to the bowels. The elimination of toxic elements can only take place by means of the bowels, kidneys and skin. Normally in febrile conditions there is a general torpidity of the emunctories. Thus it is apparent that a dose of calomel, citrate of magnesia or an alkaline solution like the milk of magnesia or a laxative mineral water, will aid in the performance of these functions.

*Local Treatment.*—It is advisable to remove the putrid membranes from the nose and throat and also the catarrhal discharges. To do this mechanical treatment consisting of the cleansing of the nose with a salt solution of the strength of one dram of table salt to one pint of water is useful. A weak (½ per cent.) solution of permanganate of potash solution can also be used to cleanse the nose by the aid of a syringe.

Septic products in the nose and throat will frequently lead to a fatal termination. Their presence is a constant menace to the blood by inviting toxemia. In addition thereto they give rise to fever and not infrequently septic material will find its way from the nose and pharynx into the Eustachian tubes causing abscesses. If neglected it may lead to mastoid involvement and brain abscesses or to septic meningitis, with *little or no chance of recovery.*

By studying the usually enlarged lymph glands, it is surprising to see what good result is apparent after cleansing the nose and pharynx.

*Local Treatment of the Pseudo-Membranes.*—The solvent effect of local remedies I have never been able to see. When papayotin has been used, I have been disappointed in its effect. Creosote vapors, by adding a dram of beechwood creosote to a pint of water and allowing the air to become impregnated with the vapor has shown some good in a few instances. Lugol's solution of iodine (half strength) applied by means of absorbent cotton, can be recommended. A steam atomizer containing a weak solution of (two per cent.) sulphurous acid is recommended by Dr. Nicholas at the Riverside Hospital. The latter has been used by me and certainly can be recommended when there are extensive necrotic patches. It is far better than the peroxide of hydrogen. Other local treatment which I have used with benefit is the inunction of unguentum Credé into the cervical glands. Rub in at least fifteen to twenty minutes two or three times a day. An ice-bag worn continually can also be recommended when there is an extensive edema.

*Hygienic Treatment.*—One of the most important adjuncts to the treatment consists in admitting fresh air. A patient with diphtheria should have all visitors excluded from the room. A good current of air should be admitted night and day, and thus oxygen so necessary in this disease is secured.

Oxygen is indicated and required when there is the slightest evidence of cyanosis. It will also relieve dyspnea when present. It is especially indicated during bronchopenumonia which so frequently complicates diphtheria.

*Fever Treatment.*—It is a wise plan to exclude antipyretic drugs during the treatment of fever in diphtheria. The best antipyretic measures consist in sponging with evaporating lotions such as alcohol and water or acetic ether, locally. Cold packs and flushing the bowel with cold water are very serviceable in some cases. When high fever, due to pneumonia, to nephritis or to any other complication exists, the same should be treated as though the disease existed independent of the diphtheria.

When fever exists and the child cries continuously then the ears should be examined. Frequently an otitis media will keep up high fever until the drum is ruptured. Ten to 20 drop doses of sweet spirits of niter are valuable if given several times a day. During the febrile stage of diphtheria calomel in $^1/_{10}$ to ½ grain doses, repeated several times a day is a useful adjuvant in fever treatment.

*Stimulation.*—Owing to the depressing effect of the diphtheritic poisons, stimulation should begin early. Strychnine $^1/_{100}$ gr. for a child one year old, repeated three or four times a day. The dose can be gradually and cautiously increased until a systemic effect is noticeable. Children will tolerate very large doses of strychnine just as they will tolerate very large doses of whisky. They can be combined. Tokay wine, champagne and coffee are valuable cardiac stimulants. Caffeine citrate and sparteine are also serviceable for enfeebled heart's action. The prognosis of a case of diphtheria is certainly better in a case where the heart has been supported until the toxemia has passed away.

65 East Ninetieth Street.

## A REPORT OF A CASE OF SPINA BIFIDA; OPERATION; DEATH.

BY CHARLES GREENE CUMSTON, M.D.,
OF BOSTON, MASS.

A. G., aged eleven months, was seen for the first time in the middle part of August, 1902. The family history was as follows: the father had contracted syphilis six years previous to his marriage but the mother, as far as one could ascertain, had never presented any signs of spe-

cific infection. The first child was born at seven months, conception having taken place a few months after marriage. Her second child was born at full term two years after the first one and presented a hare-lip, for which I had operated when the child was three months old; in other respects the child was apparently normal and fairly well-developed.

The third child was our patient. He was born at term and the labor had been an easy one but immediately after birth a reddish swelling was discovered on its back, the mother saying that at birth it might have been the size of a tangerine orange. This tumor slowly increased in size and latterly the mother thought that it had become tender on pressure as the child cried when laid on its back or during the toilet when the tumor was brought in contact with the towel.

Examination showed an apparently strong male baby while at about the level of the fourth and fifth thoracic vertebræ directly over the spinal column was a globular tumor the size of an apple presenting a rather broad base. It was covered by normal skin from its base to about the middle of its circumference while the remainder of the growth presented a reddish-blue covering. By manual pressure on the tumor, it could be reduced to a slight degree and it was noted that when this was done the large fontanelle was made to bulge somewhat and the child became uneasy as if from pain. Crying seemed to cause the tumor to become more tense and larger.

The large fontanelle was rather tense and had not become closed as much as usual considering the age of the child. Examination of the spinal column, thorax and ribs showed that there was nothing abnormal on either side. The movements of the lower limbs seemed perfect. By a carefully conducted palpation, we were not able to discover any cleft in the vertebræ. The tumor gave rise to fluctuation which was very distinct and a diagnosis of spina bifida was made and on account of the general good condition of the boy, and from the fact that the tumor was increasing in size an operation was advised.

After carefully preparing the region for several days, ether was given and an incision was carried near the base of the tumor so as to form two oval flaps. The skin was then separated from the cystic wall by blunt dissection with the finger down to the base of the tumor. After the cyst wall had been thoroughly freed, it was incised on one side and the cavity was explored with the finger. At the time of opening the cyst a considerable amount of colorless fluid escaped and after it had become emptied the bulging fontanelle was found to be quite depressed.

Digital examination of the interior of the cyst showed that it extended into the vertebral canal by a thin pedicle which passed through a cleft of the spinous process. The cleft measured about one centimeter in breadth. While exploring the interior of the sac a solid, whitish cord about the diameter of a lead pencil was found and recognized as the cord. This was inserted into the vertebral canal and a purse-string suture was placed at the base of the sac and after tying the cyst was removed by scissors. On account of the narrowness of the vertebral cleft an osteoplastic operation to cover up the gap was deemed unnecessary so that the skin flaps were simply united by aluminum and bronze wire sutures. The child stood the operation remarkably well, although when he left the table his respiration was rather rapid and the pulse beat was 145. He rallied rapidly, however, after a subcutaneous saline solution had been injected. Twelve hours after the operation, the temperature was 38.5° C. and the child was resting quietly with a pulse of 110.

The boy continued to do well for the first five days, his temperature being nearly normal in the morning with a slight evening rise while the pulse rate averaged about 100. He took his bottle well but on the beginning of the fifth day he appeared somewhat drowsy and in the evening the temperature had reached 39° C. For the next five days the drowsiness continued, the fontanelle was bulging and very tense, the child refused his bottle and he finally expired ten days after the operation.

Post-mortem examination revealed the following: After the skull had been opened a large amount of fluid escaped which was estimated at about 150 c.c. There was some blood in the longitudinal sinus. The pia was greatly injected. Both ventricals were greatly dilated and were filled with a turbid, blood-stained serous fluid. The third ventricle was also dilated while the ependyma was very hyperemic. The gray cerebral matter was very thin and in some spots it was not markedly distinct from the white matter. The medulla oblongata and pons were markedly hyperemic. Thoracic viscera normal. Spleen enlarged and soft. Perfect union of the operative wound had taken place and no cerebrospinal fluid had escaped.

A cleft occupying the fourth and fifth thoracic vertebræ was found seated in their spinous processes and protruding from this cleft was seen the cord covered by its normal envelopes. The cleft measured just one centimeter in width. The anatomical diagnosis was spina bifida, external and internal hydrocephalus.

Of the diagnosis of spina bifida there naturally can be no doubt. The tumor had existed since birth and had increased steadily in size. It was situated in the median line and when pressed upon diminished in size, caused the large fontanelle to bulge and the child became decidedly uneasy. The question is, In what subdivision of spina bifida should this case be placed? It is quite evident that a myelomeningocele could be excluded from the start on account of the absence of paralysis of the lower limbs and more especially from the fact that the characteristic anatomical conditions of this type of the congenital defect were wanting, namely, the differentiation of the medullovascular, epitheloserous and epithelodermic zones.

Both the composite forms, namely, myelomen-

ingocele antero-posterior and ventralis could also with a fair amount of certainty be excluded because the cleft in the vertebræ is usually so wide that it can be easily detected by palpation while in the case under consideration the opening in the bone could not be made out. By exclusion we therefore only have remaining meningocele, simple myelocystocele, and myelocystomeningocele dorsalis.

An uncomplicated meningocele, as is well known, is an extremely rare type of spina bifida and in most instances in which it has been observed, it has been met with in the sacral region. My diagnosis made before the operation was that of a myelocystocele because the tumor presented a broad base and also from the fact that pressure over the cyst produced a marked bulging of the fontanelle.

As far as the indications of the operation were concerned, the necessity of an absolutely correct diagnosis was unimportant because no matter which of the two types of spina bifida was present the removal of the sac is at the present time generally considered as the proper treatment. On the other hand the cleft in the vertebræ was narrow and besides paralysis and other congenital defects were absent so that there were no contra-indications.

Considering the case all together it appeared to me that an operation was clearly indicated from the fact that the tumor was and had been steadily increasing in size since birth, and sooner or later the sac would rupture. Then again, the child was to all intents and purposes strong and well nourished and the tumor was certainly causing him a good deal of discomfort.

The operation in itself was of the most ordinary kind and when the liquid contents of the sac escaped it was noted that the fontanelle became depressed, which was proof positive that a communication existed between the cyst and the subdural or subarachnoid spaces for which reasons we concluded at the time of the operation we were in reality dealing with a case of meningocele. But by palpation of the interior of the sac our first supposition was rapidly done away with because a pedicle extending into the spinal cord could be felt and which by inspection proved to be the cord itself and could be explained as a sacculated condition of the coverings of the spinal cord. Our diagnosis was therefore changed to a myelocyst complicated by a dorsal myelocele.

In the case of a simple myelocystocele the substance of the spinal cord spread out over the wall of the sac is in most instances so reduced that its removal in no way interferes with the patient's health.

The cause of death after operation for the cure of spina bifida is usually meningitis, bronchitis, enteritis or loss of strength from the draining away of the cerebrospinal fluid. The loss of the latter is so detrimental that in a case reported by Marchand in the *Revue de Chirurgie*, in 1891, he lost a patient from this cause following simple puncture of the sac.

In our case, an internal and external hydrocephalus was demonstrated at the autopsy and should have been a contra-indication to operative interference, but the symptoms pointing to hydrocephalus were not clearly marked. The child's head was not unusually large at the time we saw him, nor could it have been excessively large at time of birth since it gave rise to no impediment during labor.

## MEDICAL PROGRESS.

### MEDICINE.

**Correlation of Alcoholism, Crime and Insanity.**—Careful investigations into the etiological factors which result in filling our jails and insane asylums shows that inebriety is undoubtedly the most important. C. A. DREW (Med. Rec., June 20, 1903) says that there were 154 cases committed to the Massachusetts State Asylum for Insane Criminals during the past two years and of these only 11, or 7 per cent., claimed never to have used alcohol as a beverage. Of these 11 cases, 3 were epileptics and 2 were well-marked cases of imbecility. Ninety-six per cent. of the cases considered themselves hard drinkers, the majority having been drunk many times. He has been led to the belief that the offspring of sound, temperate parents are less likely to suffer from alcoholic insanity, though heavy drinkers, than the second generation who may not drink half as much. Pronounced alcoholism in the parents always means examples of mental disease and weakmindedness in the children, provided the alcoholic tendency is not acquired somewhat late in life. An inebriate father is certainly a handicap, an inebriate mother is a greater misfortune, but the child of an inebriate father and mother is almost certainly doomed from its birth. It has often been proven by the most eminent modern investigations that even a moderate quantity of alcohol in the circulation will cause marked changes in the cortical neurons of the brain. Changes in the nucleus, granular bodies and protoplasm may be actually seen. Because these cells are the material basis of man's moral sense and conscience, the physical representatives of his aspirations, his likes, his fears and his will power, their harm seems to be of far greater importance than the question of the food value of alcohol or the effect of alcohol on the stomach and liver. It is a law of nature that the most highly organized tissues suffer first and most from toxic agents in the blood, so it is the moral and ethical sense which suffers first and most and is often the only manifest evidence, in the first generation, of the baneful effects of alcoholics taken in moderate quantities.

**Chyluria.**—An interesting case, in which this rare condition was present, is reported by BÉCIZNEUL (Gaz. Méd. de Nantes, May 30 and June 6, 1903). The patient, a youth of sixteen, in good health, sought advice on account of the appearance of the urine, which, in the morning, was of milky consistence and color while during the day its normal limpidity was maintained. Upon standing for several hours, the specimen did not clear; neither did filtration or centrifugation restore its normal color. Examined under the microscope, numerous fine granules were seen, the nature of which could not be determined; but upon addition to the specimen of a small amount of ether, a certain number of the granules coalesced to form globules, analogous to milk globules. The presence of alubmin in large quantity was shown by the usual tests. A curious feature in the case was the fact that not only the night's repose was followed by elimination of chylous urine, but the horizontal position, maintained during the

day for but an hour and a half, sufficed to give the previously limpid urine the milky appearance seen in the morning. Out of a series of ten cases collected by the author from the literature of the subject, a like effect of the horizontal position upon the urine occurred in four. In Bécizneul's case, repeated tests showed the limpid day's urine to be entirely normal; while the night's urine invariably contained the elements of chyle. A careful study of the blood and urine failed to show the presence of *Filaria sanguinis hominis*, the most frequent cause of chyluria; therefore the case is to be classed as chyluria nostras.

**Carcinoma and Diabetes.**—The relation of these conditions one to the other has heretofore met with little consideration until the recent observations of Boas were published. He came to the conclusion that in isolated cases the carcinoma seemed to exert an antagonistic influence on the primary diabetes, but as a rule no effect is seen. Another contribution has just been made by K. OESTREICHER (Prag. med. Woch., June 11, 1903), of Carlsbad, who found four cases of carcinoma in 247 cases of diabetes under his care. His results agree with those of Boas. In one instance, the carcinoma appeared in the sixth year of the disease, and while in former years it had always been possible to reduce the sugar to a minimum amount by treatment, as soon as the carcinoma appeared the sugar could not be brought below two per cent. The same condition occurred in the following year. During the next year the tumor grew rapidly, and ulcerated. It was then found that the glycosuria became markedly reduced (0.5 per cent.); and the diabetic symptoms improved. In two other cases the diabetic symptoms became steadily worse with the appearance of the carcinoma. In the fourth case no connection could be traced between the two conditions. It is seen, therefore, that there is nothing characteristic in the course of a diabetes when a cancer intervenes, except that in one case an antagonistic influence seemed to have been exerted.

## SURGERY.

**Total Extirpation of Prostate.**—The various operations for the relief of the many distressing and even serious symptoms which arise from an enlargement of the prostate gland have received a great deal of attention of late, and are deserving of much more study on the part of the general practitioner. The total extirpation of the organ is considered by most people as an extremely difficult if not an impossible operation. P. J. FREYER (Practitioner, June, 1903) has been performing this operation several years and believes that the difficulties experienced by most men in their attempts at total enucleation result from their ignorance in regard to the anatomy of the organ. The prostate is in reality composed of twin organs, which remain separate in some of the lower animals, but in man they approach each other and become agglutinated except along the course of the urethra, which they envelop in their embrace. Each of these two bodies is enveloped by a thin, strong fibrous capsule which extends over the entire organ except along the upper and lower commissures, or bridges of tissue, that unite the lateral lobes above and below the urethra, thus filling in the gaps between them. This true capsule is intimately connected with the prostatic mass and cannot be separated from it except by dissection. The urethra, accompanied by its surrounding structures passes forward and upward between, and is embraced by the inner aspects of the two glands or lobes. The ejaculatory ducts do not pierce the capsule but enter the urethra through an interlobular fissure. The prostate thus enveloped in its true capsule is further encased in a second capsule or sheath, formed by the rectovesical fascia, numerous connecting bands, however, passing between the two. The prostatic plexus of veins and the larger arteries lie between the two capsules or in the outer one. In the operation described it is the true capsule which is removed, the sheath being left behind, thus preventing infiltration of urine into the cellular tissues of the pelvis. Another important anatomical fact not usually appreciated is the part of the gland usually enlarged and the direction it takes. The enlargement is principally adenomatous in character, and at first probably entirely extravesical. Its expansion, however, is limited by the pubic arch, triangular ligament and sacrum, so that it soon becomes necessary for its advance to be made in the direction of least resistance, namely, into the bladder. The sheath, which at the posterior aspect of the prostate is least defined, becomes gradually thinner as the enlargement advances until it is finally burst through, leaving nothing but the mucous membrane covering the prostatic gland. To accomplish the ideal operation, suprapubic cystotomy is performed after first thoroughly washing out the bladder, leaving the catheter in situ. One forefinger is then placed in the rectum and the other passed through the wound into the bladder. The mucous membrane over the most prominent portion of one lateral lobe, or over the so-called "middle lobe," is scored through by a sharpened finger-nail and graudally detached by it from the prostate projecting into the bladder. The true capsule of the prostate is here at once reached and by keeping the finger tip in close contact with the capsule, the enucleation of the prostate out of the enveloping sheath outside the bladder is proceeded with by insinuating the finger-tip in succession beneath, outside, and above one lateral lobe, thus separating the capsule from the sheath. The finger is then swept from without inward, above and to the inner side of the lobe, detaching this from the urethra, which is felt covering the catheter and pushed upward toward the symphysis, between the lateral lobes, which will, as a rule, have separated along their superior commissure in the course of the manipulations. The other lobe is similarly treated and when the apex has been freed, the whole gland is drawn and pushed into the bladder and then out through the abdominal wound. The ejaculatory ducts are usually torn across but that is of trifling importance. There is, as a rule, very little bleeding and this is controlled by irrigation with hot solution through the catheter. In several cases the urethra has been torn across completely and even portions of it removed. No subsequent ill effects have resulted from such unavoidable mishaps and such accidents are not to be greatly regretted. The remote results from such an operation are excellent and complete resumption of normal urination is almost always attained. Of 45 patients thus operated upon, ranging in age from fifty-seven to seventy-nine years, 40 have been successful both immediately and remotely.

**Sterilized Catgut.**—A rapid and easy method of sterilizing catgut is proposed by J. M. GARRATT (Am. Med., June 27, 1903), and the gut has withstood the test in some 3,000 operations. The gut is cut into suitable lengths, 10 and 20 inches, and several of these strands are placed in envelopes of unglazed paper. The latter are sealed and marked with indelible ink or pencil with the size of the gut. These envelopes, to the number of 40 or 50, are placed in a quart-size preserve jar which has been freshly sterilized, and covered with a solution containing mercuric chloride gm. 1 (gr. 15); tartaric acid gm. 5.5 (gr. 75); Columbian spirits and ether, of each one pint. Depending on the size, the gut is left in the solution for from four to twelve hours. The jar is then drained, and filled up again with Columbian spirits and tightly closed. It is essential that the Columbian spirits be used. After the needle is threaded when the gut is to

be used, the latter should first be placed in freshly distilled water. The material has been proved to be tough, pliable, strong and thoroughly aseptic.

## OBSTETRICS AND GYNECOLOGY.

**The Indications for Hysterectomy in Puerperal Sepsis.**—A very able argument on the various means and methods to be pursued in this condition is set forth by VALÉRE COCQ (Gaz. de Gyn., April 1 and 15, 1903), and the results of the discussion are told in the following summary: In general hysterectomy is indicated when there is a grave toxemia or when the uterus has in all probability become the chief entrance of the septic material; and in spite of all other means of treatment have been tried and the patient is still sufficiently strong to withstand the operation. These conditions are present in certain cases where the placenta has been retained and is undergoing decomposition and where it cannot be removed by the curette. Also in the case of a suppurative metritis where fibroids have undergone prolonged compression during the course of labor, degenerating, and clogging the flow of the lochia by their rough surfaces, destroying the endometrium, facilitating the reabsorption of the septic products through their great vascularity. In streptococcic septicemia the ablation of the uterus which, though macroscopically without lesion, but in reality thronged with the organisms, exercises a most happy influence on the final outlook in the patient's recovery. Cases where there is large involvement of the parametrium and the adnexa are only too often treated by ice and opium in the hope that operation may be avoided, but sooner or later the radical operation is found to be necessary to save the life of the patient.

**Conservative Surgery of the Appendages.**—Since the month of May, 1896, to the month of December of last year, HECTOR TREUB (Am. Gyn., May, 1903) has operated upon, or treated in his clinic, 612 cases of salpingo-ovaritis. Out of these, 70 per cent. have been more or less completely cured, without operative intervention. The uniform treatment in all of these cases has been as follows: Complete rest in bed and the application of an icebag as long as there was any fever; the acute symptoms passed, warm vaginal injections (45° C.), vaginal tampon with glycerine and warm water compress (Priessnitz's bandage) on the lower part of the abdomen. The duration of treatment varied from a few weeks to several months; the average duration could be rated at about six weeks. In every case the woman considered herself cured, having no longer subjective symptoms of the disease. Out of the 70 per cent. there are about 20 who have been treated more than once in the same manner, which would equal about 5 per cent. of relapses more or less serious and in every case sufficiently troublesome to necessitate another sojourn at the clinic. In order to be certain not to exaggerate the results of non-operative treatment, it may be said that little over one-half the cases of salpingo-ovaritis necessitated no operative intervention whatsoever. The significance of this fact is clear, and it is important to emphasize it, since in these modern times, even, it is held a part of good surgery to remove the appendages when they are diseased. Massage is excessively dangerous in the cases of obstinate salpingo-ovaritis, where one is never sure of not finding a purulent focus of inflammatory intraperitoneal mass. Although the final results will not be uniform in all the cases treated by non-operative intervention, one finds that conservative treatment offers: (*a*) A danger of death which ought to be estimated two per cent. at the most; (*b*) some chances more or less great of not giving complete relief to the patient; (*c*) some chances also of being insufficient and necessitating a second operation either conservative or radical; (*d*) the certainty of not procuring for the patient a new malady, under the form of the anticipated menopause. Again: medical treatment suffices in at least one-half of the cases of salpingo-ovaritis. It being insufficient or contraindicated, one should never at the outset perform a radical operation of any sort. The first operative stage should always be posterior colpotomy. When by means of this proceeding it is discovered to be a tuberculous process, hysterectomy should be performed as soon as possible. In cases of hydrosalpinx which do not yield to repeated colpotomy, and which necessitate other intervention, and in cases in which one wishes to remedy sterility in women, the conservative operations (resection, salpingotomy, salpingo-ovarosyndesis) are indicated. Salpingorrhaphy should be reserved as an accessory operation to a course of laparotomy performed for no matter what other indication.

**Weight Wave of Menstruation.**—The record of the daily weight of four healthy, unmarried women between the ages of twenty-two and twenty-nine, and of average menstrual regularity, during a total of 23 menstrual periods, discloses a phenomenon which W. T. BELFIELD (Jour. Am. Med. Ass'n, June 13, 1903) terms the weight wave of menstruation. During several days, especially the first, preceding the flow, there occurs a progressive increase in weight, from 2.5 to 5 pounds, which may be from 1.5 to 5 per cent. of her usual weight. The climax of this gain is followed by a rapid loss of about half within eight to sixteen hours, and then a more gradual loss of the remainder, extending over several days. The flow begins during the loss, often following immediately on the crest of the wave, and terminates about when the weight returns to its normal lever. The premenstrual gain is due to diminished excretion, especially of water, and the rapid loss to rapid excretion, notably of carbon dioxide and water. After the weight has sunk to its premenstrual level, there may be another crescendo and diminuendo movement, lasting several days, but less pronounced. Hereafter the weight shows no constant variation until there occurs a sudden transient loss which is the forerunner of the next period. Two cases of irregular menstrual habit, exhibited the wave on several occasions when the flow was nearly or quite lacking. A woman of fifty-nine years, who had not menstruated for twelve years, showed no characteristic wave. For two days preceding the climax in weight there is often marked torpidity of the bowels and scantiness of urine; while, with the decline in weight, excretion in all channels is notably increased. The temperature curve is not constant; there is usually a rise of about 1° F. during the increase in weight and a sudden fall after the crest of the wave is passed.

**Immediate Delivery in Eclampsia.**—Statistics have shown that 75 per cent. of the deaths which take place as a result of childbirth are caused by infection and puerperal fever. The remainder are mainly due to hemorrhage and eclampsia. The treatment of the latter cases has left much to be desired until very recently. E. BUMM (Münch. med. Woch., May 26, 1903) gives the result of his extensive experience, having personally treated 112 cases during twenty years, by all the methods in vogue at different times. His observations during the past two years have convinced him that in every case where the eclampsia is seen soon after the first attack, while the pulse is good and the lungs are still intact, a favorable issue always results from the immediate emptying of the uterus. The mortality according to his belief, will be reduced to not over five per cent. by this procedure. If the cervix is completely dilated, version, forceps or, if necessary, perforation is indicated. If the cervix is partially opened, further dilatation may be best accomplished by combined version, pulling down a foot and using the breach to complete

the dilatation, and the author believes it can be done just as quickly and possibly with less danger for the unpractised, than with the metal dilators. For a closed cervix and delivery indicated at once, the vaginal Cæsarian section as devised by Duhrssen, is the method to be preferred.

**Conservative Operations in Sclerocystic Ovaritis.**—A plea for the conservative treatment of sclerocystic ovaritis is made by A. BOURSIER (Jour. de Méd. de Bordeaux, May 24, 1903), who holds that the choice between the radical and conservative operations should depend upon the condition of the tubes. In his belief, castration should be resorted to only when the tube is seriously involved, as well as the ovary. When, however, the tube is healthy or shows but a slight thickening of its walls, or a congested condition, with permeable lumen and orifices is present, he gives the preference to partial resection of the ovary or ignipuncture of the cystic follicles. It is the author's practice, in the case of a large cyst, to resect as completely as possible the diseased tissue, and suture the wound with catgut. When, however, numerous small cysts are present, he has obtained his best results from multiple ignipuncture; care being exercised to allow no smallest cyst to escape cauterization, lest it should increase in size and give rise to a return of the distressing symptoms. The immediate relief obtained by such conservative operations has been, in Boursier's experience, invariable; though in a certain number of cases, there was a temporary return of pain as the menstrual period was approaching and in nervous subjects, a continuance of pain was not uncommon. A complete cure is recorded in 30 per cent. of the author's cases and pregnancy occurred in 2 out of the 23 who were kept under observation.

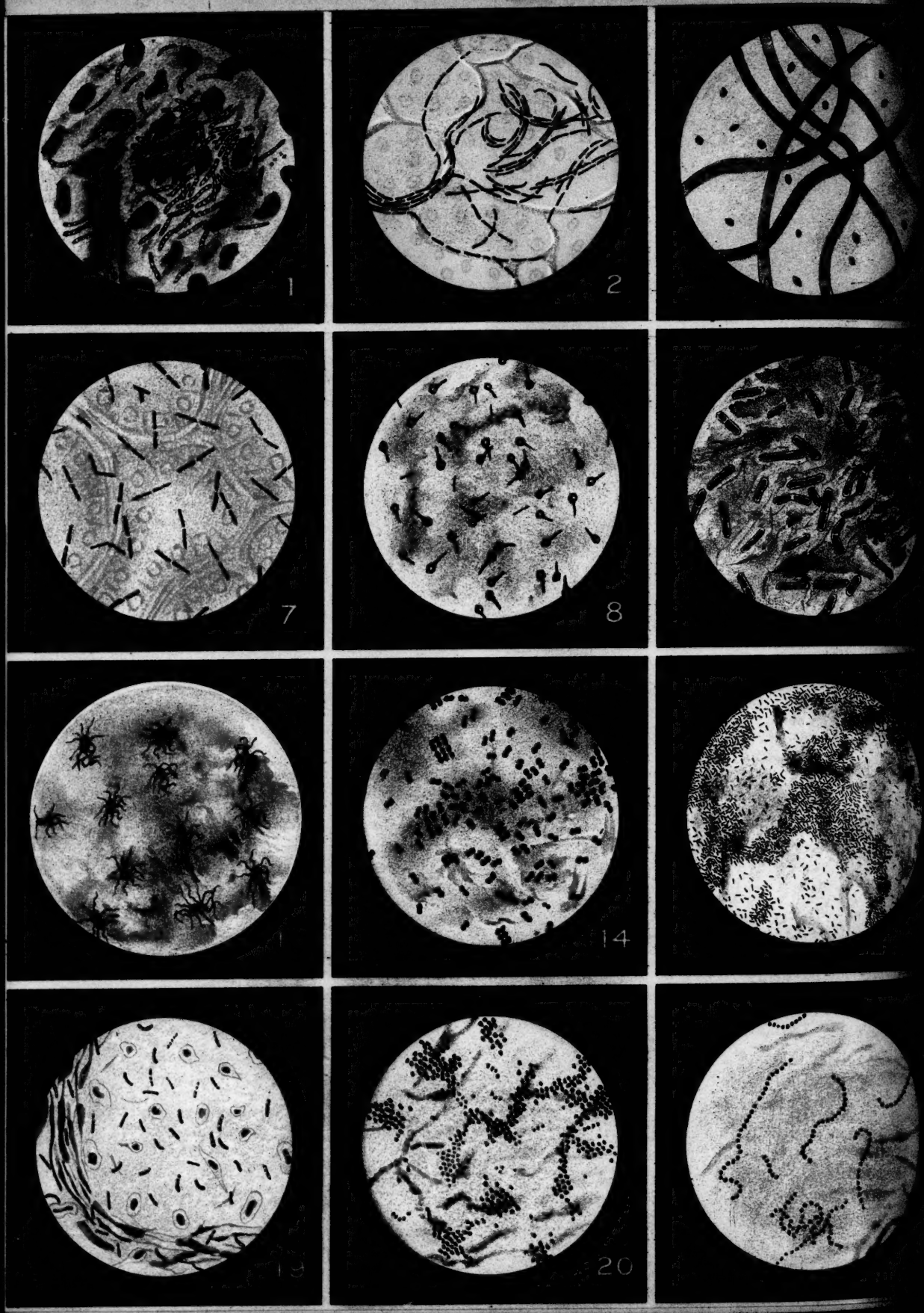
**Uterine Myomata and Sterility.**—The statistical evidence presented by numerous authors is so contradictory that no definite conclusions can be drawn as to the direct influence of uterine myomata on sterility. Some further figures are presented by L. AUSTERLITZ (Prag. med. Woch., June 11, 1903), who brings forward the clinical material of the gynecological clinic at Prague seen during a period of nine years and including 5,217 cases. Of these 339 or 6.5 per cent. were afflicted with uterine myomata, and among 302 of the latter class, who were married, 80 never carried a child to term and 67 never conceived. The remainder were fertile. Considering a primary sterility as a condition in which conception had not occurred during the first five years of married life, or where five years had elapsed after child-bearing without any conception following, it was found that this occurred in 151 cases, or 4.17 per cent., which presented no evidences of myomatous disease, and in 61 cases, or 20.23 per cent., afflicted with myomata. Secondary sterility in the former class was found in 13.68 per cent., and in the latter in 21.85 per cent. This evidence shows that there must be some relation existing between myomata and sterility. Fertility seemed least affected by the submucous myoma, especially of the pedunculated variety, and successively more by the subserous, interstitial and the mixed forms. Among the unmarried cases conception also seems to have been markedly influenced by the presence of myomata, for in the latter case it occurred in 18 per cent., while among the non-afflicted unmarried women, conception took place in 56 per cent.

## HISTOLOGY, PATHOLOGY AND BACTERIOLOGY.

**Agglutination of the Bacillus Subtilis.**—The number of spore-bearing micro-organisms for which agglutination has been determined is comparatively small. S. S KNEAS and J. SAILER (Univ. Penn. Med. Bull., June, 1903) have found that the *Bacillus subtilis* gives a typical reaction of agglutination with the blood serum of rabbits into which it has been injected, in dilutions as high as $^1/_{2500}$. Owing to its size and motility, it is an excellent subject for the demonstration of this reaction. Although it has generally been considered one of the most perfect types of a non-pathogenic micro-organism, later investigations have shown that under certain circumstances it may become pathogenic, causing death in the lower animals and a destructive inflammation in human beings. A number of such cases have been reported but nothing definite has been formulated.

**Chemical Pathology of Acromegaly.**—The chemical abnormalities that occur in this disease have been but little studied. Some recent studies on this subject have been made by D. L. EDSALL and C. W. MILLER (Univ. Penn. Med. Bull., June, 1903) on one case which exhibited striking progress and presented no signs of diabetes, and were controlled by another in which the disease was at a standstill. Careful measurements were taken and the food, consisting of milk, meat, rice, bread and butter, analyzed for the quantity of $P_2O_5$, CaO, and N. Analyses of urine and feces were then made. The figures in general demonstrate a striking retention of phosphorus and nitrogen, and a less marked retention of calcium, a condition of affairs that is somewhat remarkable when we consider that in this disease the skeleton shows such notable changes. The excessive nitrogen retention gave expression in the abnormal growth of the soft tissues, a common feature of this disease. The very large retention of phosphorus can only be explained by considering that it is used in constructing tissue that is especially rich in phosphorus, as the calcium retention was relatively small. As these cases are usually imbecile, it may be assumed that the overgrowth is in the nervous tissues. Under normal circumstances the amount of calcium in the daily feces is eight or ten times the amount in the daily urine. In this case, however, the amount in the urine nearly equaled that in the feces. This is a condition frequently met with in diabetes mellitus, when acid intoxication is present, and has also been produced by a strict proteid and fat diet. No definite conclusions could be reached from the experiments made to explain this fact, but it seems that there is some abnormality of metabolism that causes a solution of calcium from the bones at the same time that there is in other parts of the bone an abnormal deposition of bone salts. This does not appear to be the result of general acid intoxication, but is probably due to the formation of some acid that combines with calcium with especial readiness. Some of the calcium is apparently carried off in solution, another part may be simply redeposited and leads to the abnormal growth of bone. Of this, however, we have no definite knowledge. These observations seem to emphasize the view that there is in acromegaly a growth of abnormal bone rather than a mere abnormal growth of bone, and that there are every marked abnormalities in the soft tissues, as well as in the bones. Further studies may demonstrate that the alterations in the bones are the result of metabolic abnormalities rather than of a mere tendency to distorted overgrowth.

**Proteinochrom, a New Color Reaction.**—Some years ago a substance of undetermined chemical composition was discovered as one of the end products of albuminoid disintegration, which reacted with chlorine or bromine to form a violet-red pigment body—proteinochrom. It was found to occur as a result of fermentation in pancreatic digestion, and as the result of bacterial action in the decay of albuminoid substances. Some further clinical and bacteriological investigations have lately been conducted by P. ERDMANN and H. WINTERNITZ (Münch. med. Woch., June 9, 1903). Attempts to demonstrate the presence of proteinochrom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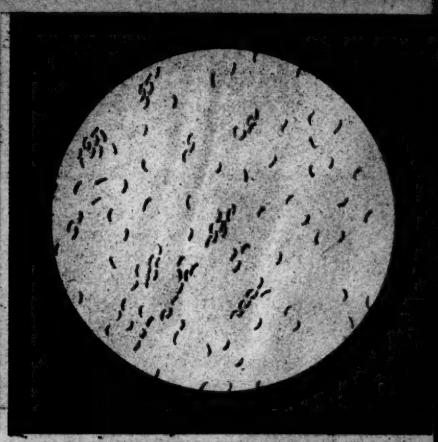

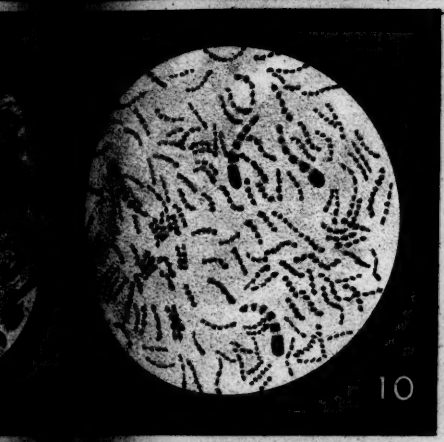
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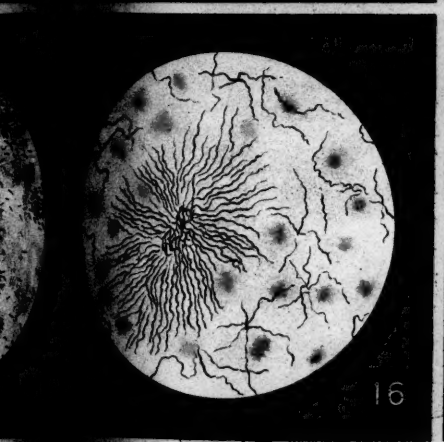
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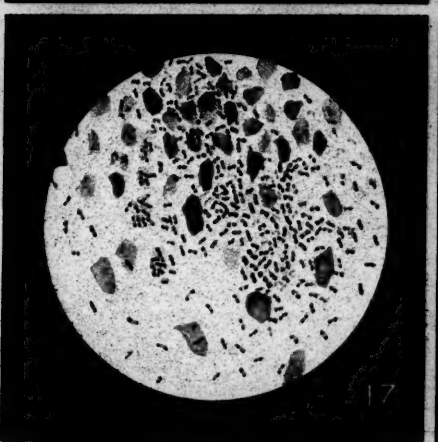
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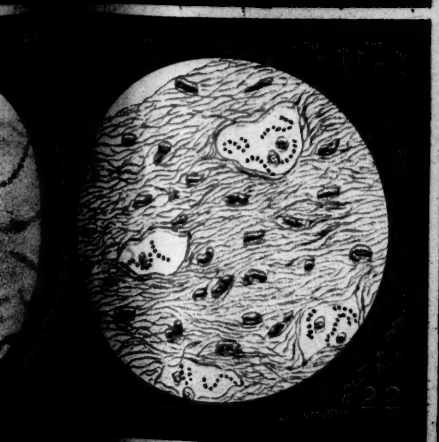
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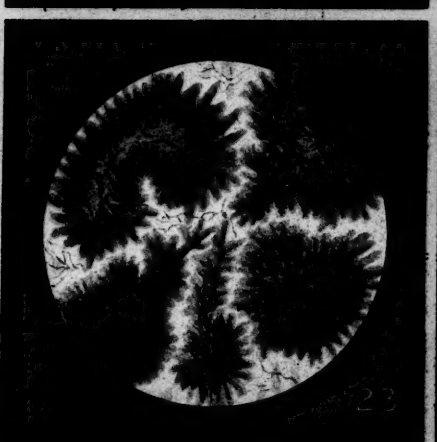
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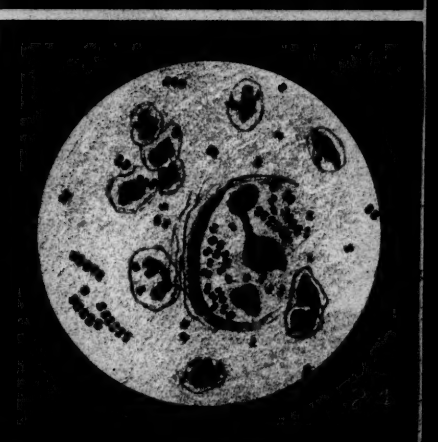
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during gastric digestion after test meals in perfectly normal individuals, were unsuccessful, as were also those in pathological cases of a non-malignant type, such as chronic gastritis, anacidity, sub- and hyperacidity. In cases of malignant disease, the reaction could only be demonstrated when there was present a retention of the gastric contents, due to stenosis. When the stomach was washed out before the test meal was given, no reaction was found. As a differential diagnostic sign, the test is therefore only of value in advanced cases. The reaction was also demonstrated in the diarrheal stools accompanying tuberculosis, chronic catarrhal enteritis and typhoid. In normal feces the reaction was not found. As the proteinochrom was believed to be a product of bacterial metabolism, particular attention was given to its appearance during the growth of various bacteria on suitable media. It may be compared with indol, which is a product of the same sort, although of somewhat different origin. The tests were made on solutions and bouillons made with peptone. Large numbers of bacterial species were studied, and it was found that proteinochrom was formed by the majority, although the appearance of the reaction varied from one to ten days. If the appearance was delayed longer than ten days, the test was considered negative. Comparing the results with the tests for indol, it was seen that certain bacteria formed indol but no proteinochrom, whereas others formed both, but with a marked difference in time, of appearance. The diagnostic value of the reaction depends on the information which it affords regarding the biochemic activity of the bacteria, in other words, to what stage the bacterial disintegration of the albuminoids has proceeded, the appearance of the proteinochrom reaction indicating that it has advanced to the formation of leucin and tyrosin. In differentiating a typhoid from a *Bacillus coli* infection, it was satisfactorily demonstrated that cultures of the latter showed no proteinochrom reaction, while the presence of indol could be demonstrated on the second day. In contradistinction to this, the cultures of typhoid bacilli showed the proteinochrom reaction from the second day on, whereas the indol had not appeared by the fourteenth day. This seems to point favorably to a new color reaction for the typhoid bacillus, which may aid in differentiating it from the *Bacillus coli communis* in doubtful cases.

## GENITO-URINARY AND SKIN DISEASES.

**Myositis Syphilitica.**—In a study on Myositis Syphilitica, J. A. FORDYCE (Jour. of Cut. Dis., April, 1903) says that the involvement of the muscular system by syphilis is of relatively rare occurrence. Matzenaur, in Neumann's clinic, has observed, in the early period of the disease, one or two cases among seven thousand patients with syphilis. The early so-called myalgias may be due to hyperemia with slight exudation in the connective tissue of these organs or to irritation of the peripheral nerve by the disseminated poison of the disease. They have, as a rule, little clinical significance, as they usually rapidly disappear. The majority of textbooks on syphilis speak only of the diffuse interstitial myositis of the early period and the circumscribed gummatous tumors of the late stage. It is not always possible, however, to assign the cases seen in clinics to these two groups. In malignant precocious syphilis, gummata, usually in several muscles, have been observed in the early period of the disease. Matzenaur has seen multiple diffuse myositis and gummata in the same patient and the same conditions in the late stages of the affection. He has also called attention to the occurrence of muscle abscess following a diffuse myositis four and seven months after infection. A single muscle gumma in late syphilis can readily be mistaken for a sarcoma or other muscle tumors or infiltrations. Hartley has recently emphasized the importance of syphilis from the surgeon's standpoint, and has called attention to numerous errors in diagnosis in these and other specific conditions. The possibilities of syphilis are perhaps not so keenly appreciated by the general surgeon as by the syphiligrapher, and for this reason the observations of the one should supplement those of the other. Another type of myositis, presumably syphilitic, has been described by Herrick, in which a syphilitic patient suddenly developed painful swellings in the supinator longus and in the calf muscles. Examination of pieces of the involved tissue showed a diffuse inflammation with hemorrhages. He failed to find either vegetable or animal parasites, and attributed the condition to a specific infection ten years before the present trouble began. The author's critical comparison of his own case with the disease known as polymyositis acuta leaves doubt as to its true nature. The disappearance of the muscle swelling under such doubtful antisyphilitic treatment as iodine and iodide of potassium ointment scarcely lend weight to such a diagnosis. The histological investigations of Matzenaur show that the initial changes in the interstitial myositis and the gummatous variety are the same. In early syphilis the inflammatory process tending rather to diffuse changes, while in late syphilis more sharply circumscribed infiltrations result. The blood-vessels of the interfibrillary connective tissue are first implicated; the muscle-substance being secondarily involved. The preservation of the functional integrity of the muscle can only be secured by early recognition of the nature of the disease and a prompt recourse to specific remedies. The results of the affection are seen in the sclerotic changes which take place in the tongue as a result of chronic interstitial myositis in this organ.

**Massage of the Prostate and Albuminuria.**—The universal employment of massage in the treatment of gonorrheal prostatitis lends interest to the following observations of C. KRUGER (Münch. med. Woch., June 9, 1903). Two patients of nervous disposition, but otherwise normal, presented a chronic prostatitis of a gonorrheal origin, for which massage was instituted. During a period of five weeks albumin was constantly present in the urine while the massage was continued. A nephritis could not be demonstrated and sources of albumin from the contents of the bladder could also be excluded. In one patient a transitory albuminuria appeared on severe exertion at other times, but was not evident during the period of treatment. Tests were also made after various exercises in both patients, but resulted negatively. The author advises careful watching of the urine for the appearance of albumin in these cases and if combined with the presence of renal epithelium and casts, the massage should be stopped, and guardedly continued in the other cases. The author advances several hypotheses for the appearance of this condition, the principal idea being that the diseased prostate secretes substances, which have an irritating effect on the kidneys during the process of excretion, after they have been forced into the circulation by the massage.

**Diagnosis of Leprosy.**—An interesting account of the routine method of examining cases of leprosy in Hawaii is given by J. T. MCDONALD (Jour. Am. Med. Ass'n, June 6, 1903), who also draws particular attention to the general prevalence of the disease and the liability of its being undiscovered. He details the observations made on 150 cases. As a means of diagnosis the microscope stands in first importance, a minute strip of tissue being teased out and stained with Ziehl's carbol fuchsin in the same manner as for tuberculous sputum. Of clinical symptoms, maculæ, chiefly leucodermic spots are found in 89 per cent. of all cases. The lepra nodule

found in 74 per cent. is the chief distinguishing lesion of skin leprosy. Thinning or complete loss of eyebrows and eyelashes is present in 63 per cent. Atrophic changes in hands and forearms with retraction and contraction of fingers and enlarged ulnar nerve in 32 per cent., is a leading feature of nerve leprosy. The plantar ulcer was found in 26 per cent., absorption of phalanges in 16 per cent., facial paralysis in 11 per cent. The entire body should be carefully tested for anesthetic areas.

**Treatment of Nevus by Hot Water.**—The coagulating power of heat has been turned to good account by its use in the treatment of nevoid growths. F. GRIFFITH (N. Y. Med. Jour., May 2, 1903) reports a case of nevus of the scalp and nose in a child seven months old where this mode of treatment proved very efficacious. Injections were made by means of a sterile hypodermic syringe and needle with the sterile water at a temperature of from 180° to 200° F. One fluid dram was injected without the aid of anesthetics and reaction was manifested by distention of the mark till it became a tense, blanched, cystic tumor. Injections were continued every three or four days for a period of three weeks when shrinkage and a flattening of the mark at a level of the surrounding surface had taken place.

## EYE, EAR, NOSE AND THROAT.

**Treatment of Purulent Conjunctivitis.**—The first step in the treatment of every case of purulent conjunctivitis should be the microscopical examination of the pus to determine the variety of micro-organism present. If the examination cannot be made at once it is usually best not to delay treatment to await the results. E. S. THOMAS (Med. Rec., May 30, 1903) doubts whether the mild cases of conjunctivitis are ever gonorrheal in origin, so virulent is the usual condition produced by this germ and it is a fact that in the mild cases the gonococcus is not found. When the case is seen early a two-per-cent. solution of silver nitrate should be at once thoroughly applied to the whole conjunctival sac and an applicator with cotton should be carried entirely through the cul-de-sac under the upper lid. This latter procedure cannot be employed in children, but a thorough cleansing can usually be done. If the case is seen later and is very severe, a daily application of a three- or four-per-cent. silver solution may be indicated. With these stronger solutions it is best to neutralize with salt solution and also lay a pledget of cotton soaked in salt solution upon the cornea while making the application. Daily applications of silver are to be supplemented by irrigations with boracic acid solution, frequent enough to keep all secretions washed out. Cold applications prevent too great a reaction to the silver. Protargol is sometimes indicated when silver proves too irritating, as evidenced by increased discharge of serum and a tendency to bleeding. Protargol should not be used in stronger solutions than six per cent. Argyrol, 25 per cent., is actively germicidal and non-irritating and is a very valuable application if the astringent action of silver is not required. Protargol and argyrol are especially applicable to the cornea, as no staining may be feared from their use.

**Blepharitis Marginalis.**—Intractable cases of this disease are frequently met with and the routine treatment of text-books is found very unsatisfactory. D. S. REYNOLDS (N. Y. Med. Jour., June 6, 1903) has departed somewhat from the customary use of ointments in some of these cases and has obtained excellent results. One of the commonest forms of blepharitis marginalis seen in persons of every rank and station in life and of all ages, is that in which there is slight thickening of the borders of the lids. The anterior margins are dry and red, and the lash on close inspection is observed to be thin, while the cuticle between the hairs is covered with minute scales of desquamating epidermis. Many of these cases disappear entirely under correction of errors of refraction, of intestinal constipation and various conditions of malnutrition. Oftentimes, however, a complete cure seems almost impossible and recurrences are frequent. There is a fungus undoubtedly present in the hair follicles of such cases, and it is believed that these may be best eradicated by the periodical application of pure carbolic acid. The acid is prepared by adding about ten minims of alcohol to a dram of crystallized carbolic acid and agitating sufficiently to dissolve the acid. The point of a needle is dipped into this fluid and while the lid is firmly held with one hand, the detachable scales between the hairs are scraped off and the application of the acid made as direct and complete as possible to all the hair follicles of the margin of the lid. By repeatedly dipping the needle into the acid and scraping the skin, taking care that none shall run over the free border, the application can be made so thorough as to whiten all that portion of the skin containing the lash. The smarting which results should last only a few minutes. About the fifth day a crust of epidermis may be removed and a yellow oxide of mercury ointment applied. The carbolic treatment should be repeated in about ten days and in about three months, in most cases, a luxurious growth of lash has come in and with it an entire disappearance of all signs of blepharitis. In the more advanced cases which present an excoriated, glazed, rounded appearance of the torsal margin with no sign of lash or even in those instances where the removal of an abundant accumulation of inspissated serum discloses an ulcerated condition of the lids the use of the phenol is very beneficial. In the latter condition the ulcer should be thoroughly cleansed and dried and then the phenol carefully applied to its base. Striking results are thus frequently obtained.

## THERAPEUTICS.

**Vassale's Paraganglina in Gastro-intestinal Atony.**—The effect of this remedy—an extract of the suprarenal capsule of the ox—upon gastro-intestinal atony has been studied, in a series of cases, by U. BACCARANI and A. PLESSI (Gazz. Osped., June 7, 1903). The known effect of the suprarenal's active principle (which has been shown to reside in the medulla) upon unstriped muscular fibers, inducing their more forceful contraction and maintaining their tone, has, in the author's cases of gastro-intestinal atony, exerted a uniformly favorable influence. In gastric atony, 40 to 60 drops, divided in 5 to 8 daily doses, gave speedy relief and in the majority of cases, the cure was permanent, after suspension of treatment. In a certain number of cases, the remedy, when given by mouth, failed to influence intestinal atony; though there was immediate response to its effect when injected into the rectum. From this the authors conclude that atony of the large intestine was responsible for constipation in the latter class of cases and that atony of the small intestine was indicated when a favorable effect followed its administration per os.

**Antnrasol, a New Tar Preparation.**—The objectionable features of the ordinary tar preparations have led to the attempt to produce a substance free from the pitch and coloring matters, and one which, being in a more fluid form, would be less liable to become thick and harden. A. SACK and H. VIETH (Münch. med. Woch., May 5, 1903) have succeeded in producing a purified tar, which is fluid, of a light yellow color, and of the consistency of olive oil, but possesses the characteristic odor of tar. On account of its thin consistency it can be readily applied with a brush. It penetrates the skin very readily and leaves no residue.

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## RADIO-ACTIVITY AND ITS POSSIBILITIES IN THERAPEUTICS.

RENEWED attention has recently been called to the substances that produce special spontaneous radiations which affect photographic plates and various sense organs of the human body and are physically recognizable in a number of curious ways. Professor Marckwald, of Berlin, made a series of demonstrations at the sessions of the International Chemical Congress held in Berlin during June. The metal experimented with was polonium, which so far has been but very little known and whose full powers were only more or less suspected. There is no doubt now that this new metal has the power of communicating the radio-active energy which it possesses to a number of other substances and that in this respect it must be compared with, if indeed its qualities do not exceed, the similar properties of radium. Now that physical therapeutic measures, hydrotherapy, massage, and vibratory stimulation of various kinds are coming to have due recognition as important remedial agents there is hope that these new metals may also prove of special service in the treatment of affections likely to be influenced by nervous stimulation or trophic alterations of any kind.

It is now some years ago since Professor Javal, the distinguished French ophthalmologist announced to the French Ophthalmological Society, that the X-rays could be made to produce certain effects upon the optic nerve of patients whose ocular media were disturbed. A short time after he made the additional announcement that uranium and the Becquerel rays, and, especially, radium with its wonderfully active qualities, might be of service not only in diagnosis, but to a certain extent in supplying the stimulus of the optic nerve that is ordinarily produced by light. The usually accepted discoverer of radium, M. Curie (though it is now definitely announced that he owes his temptation to study these substances to the initiative of Madame Curie, who had already made definite progress and more than suspected the existence of radium before her husband entered the field), pointed out at the beginning of his investigations on radium that the metal had a very definite action on superficial cutaneous nerves. He found that if a small glass vial containing even a minute quantity of a more or less pure radium salt were carried in the pockets for some hours the skin beneath the pocket became reddened, later it lost its superficial covering with the production of an ulcer rather difficult to heal.

This effect would seem to be manifestly a result of interference with the trophic nerve fibers leading to the particular skin area. The effect is not produced immediately but, as in the case of the X-rays, may be delayed for many hours or even days. The ulcer produced shows practically no tendency to heal for a considerable period, so that evidently the vital resistance of the part somehow dependent on its connection with the central nervous system is very much lowered. In recent times M. Curie has expressed the opinion that if a considerable quantity of radium in its pure state could be obtained, say, for instance, a kilogram (2⅕ pounds) that he would not care to enter the room in which it was placed, since there would be danger of lasting injury to the optic nerve and to the skin surface all over the body.

It seems clear that agents as powerful as these substances seem to be may well prove to have an important place in modern therapeutics. It is only within this last year or two that it became clear that for some forms of malignant disease the X-rays produce wonderful and as yet inexplicable effects that resemble, more than any other method of treatment ever introduced, nature's curative process in certain very fortunate cases of malignant disease in which the growth disappears spon-

taneously. Just what the effect is due to cannot as yet be determined. It would seem, however, that the growth of a neoplasm, even of a malignant type, depends on the trophic influences transmitted to it from the central nervous system. While the overgrowth of certain cells is a true insurrection among the citizen cells of the republic of the body, these depend for their possibilities of overgrowth on the ordinary metabolic processes of the system which are so much under the domination of trophic nerve centers. If nerves can be interfered with then by means of the paralyzing action of forms of radiant energy such as are now familiar in the X-rays and the radiant metals, it is not impossible that a very perfect method of cure for malignant disease may be at hand.

Up to the present time the price of these metals makes medical experimentation practically impossible. Radium, by those familiar with the conditions, is said to be worth about $2,000,000 a pound. It is not improbable, however, that other sources of the metals will be found than the one collection of mineral material in which, so far, they have been demonstrated to exist. Pitchblende is common enough and while only the one variety of pitchblende that is found in the Joachimsthal in Austria has so far proved to contain the precious radiant metallic combinations, it is not unlikely that corresponding material may be found among the rich and varied mineral deposits in our own country. As the material from which they are obtained is originally a waste product the value of the metals may be very much reduced by such a discovery.

Methods of preparation, which at present are long and complicated, constitute the real expense and these have been very much simplified in the last year, according to an announcement from Madame Curie herself, and there seems no doubt that further simplifications with great reduction in the price of these substances will occur in the near future.

Meantime we shall wait with not entirely hopeless anxiety to hear the first results from the therapeutic use of these metals. Professor Marckwald's demonstrations at Berlin make it clear that polonium is capable of communicating its radiant energy to many other substances in a very marked way. It is this quality that most of all might be expected to be of use in therapeutics. In his demonstrations Professor Marckwald used only about one-sixth of a grain of polonium. This indicates the wonderful latent energy that is contained in the new metal and shows that the time will not have to be waited for when large quantities of it are at hand for experimental purposes before the metal can be used in practical medicine.

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### THE MOSQUITO'S DEATH KNELL.

THE old saw that "Big fleas have little fleas to bite them; and little fleas have lesser fleas, and so *ad infinitum*," is applied very ingeniously by Dr. Charles Warner Stiles—whom we might designate as the great American germ discoverer—to the extermination of the mosquito. In addition to serving as intermediary host for the parasite of malaria, the mosquito, it seems, entertains a little on his own account. He has a plague of a guest, named *Agamomermis culicis*, a parasite that kills millions of mosquitoes each year. If it is a "bad year for mosquitoes," the assumption is that it is a good year for *Agamomermis culicis*. This parasite has its habitat in the abdomen of the mosquito. Infection takes place in the larval or pupal stages of the mosquito. The infected mosquitoes are sluggish and short-lived, and the females do not breed.

Now, if the parasite can be cultivated and let loose upon the unborn mosquito, the theory is that he will be exterminated, and the place thereof shall know him no more. The only difficulty is how to do it. Possibly one might do cultures of this fatal parasite up in portable form like a fire extinguisher, with a small family size for cottage use, and a larger size for hotels. There could even be a handkerchief culture, something like a nitrite of amyl drop, that could be crushed in a handkerchief, letting the germs loose while walking through the meadows to one's suburban home.

The only satisfaction, however, that one could have on such occasions would be the purely altruistic one of infecting the young of the mosquitoes that were biting at the time, so there should be fewer to bite one's neighbor when he walked that way. If people were only more apt to be altruistic when they were being bitten by mosquitoes this scheme of throwing their parasites at them might work very well, and whole communities could combine and subscribe for the cultures.

Dr. Stiles admits that there is a little practical difficulty in distributing the parasite; but the government, we are led to believe, thinks it is the greatest thing out. And so it undoubtedly will be when Dr. Stiles has discovered some rapid and inexpensive way of breeding *Agamomermis culicis* in all the marshes where mosquitoes live.

## HYGIENE IN THE PUBLIC SCHOOLS.

EACH year, just after the close of the schools, the Regents of the University of the State of New York invite all those formally connected with educational institutions of various kinds in New York State and all others who are interested in our educational system to a conference held at Albany and known as University Convocation.

We are very glad to find that one of the discussions at the convocation this year had for its subject the important question of the teaching of hygiene in our public schools.

There is no doubt in the minds of those who have looked into the matter with any care that the present system of teaching hygiene to our public school children is not only inadequate to the purpose of giving a reasonable idea of an important practical, applied science, but also some of the prominent features of the teaching of what is supposed to be hygiene are not in accord with the opinions of those who in medicine and physiology as well as bacteriology and sanitary science are most favorably situated to know what the trend of scientific thought is at the present moment.

The discussion at Albany on June 30 was opened this year by Dr. Helen Putnam, of Providence, R. I., who suggested the necessity in the high schools of large cities, at least, of a special department of hygiene, to be presided over by some one who has made special studies in this branch. Her paper worked out in detail the arrangement and management of this department. There is no doubt that the recent progress in the science of hygiene not only amply justifies this idea, but it seems evident that no other satisfactory method of teaching this important subject can well be devised.

After all the most fundamental element in the establishment of a special department of hygiene must be the assurance that this department shall keep thoroughly abreast of the times, and as hygiene is above all an advancing subject, only those who are well grounded in all its principles should be permitted to instruct in this important branch. The development of our public school teaching of hygiene must come, and it is along these lines of specialism so accordant with the specialistic tendencies of our time that reorganization should be directed.

As was brought out in the discussion of Dr. Putnam's paper, the importance and the interest of hygiene as a subject for study among school children can scarcely be exaggerated.

Sanitarians have been making history in recent years that is much more important for the happiness and the evolution of the race than anything that the military men have ever succeeded in doing. None of our military operations during the Spanish-American War compare at all in importance or even in the effect they will produce to what has been accomplished by the army medical department for the sanitation of the West Indies during our few years of occupation of Cuba. There has not been a single case of yellow fever in Havana for nearly two years, though that disease was endemic there for probably two hundred years and there has been no case of smallpox for over two years, although that disease constituted one of the most serious occasional factors in the death-rate in the Island. The study of the fevers and peculiar anemias of Porto Rico has given important hints for the elucidation of anemic conditions not necessarily connected with malaria in tropical countries all over the world. Surely American children should know something of what is thus being accomplished by their fellow countrymen. There will be no lack of interest in the matter if it is only properly presented.

Sanitation has accomplished great wonders in other parts of the world as well as in the tropics. There are many thousands of people saved from death every year as the result of the enforcement of sanitary regulations in large cities, who would have been brought to an untimely grave if the death-rate of even ten years ago continued to prevail during the last two or three years. The head of the Board of Health, of Chicago, announced, as the hot weather came on, that there would be many thousand fewer little graves in the cemeteries of Chicago this year than were necessary even five years ago, though the city has increased in population not a little during the last five years, because the factors on which infant mortality depend are better understood and better methods for its diminution are in vogue.

The progressive president of our greatest university in this country, who is accustomed to interest himself in all matters of significance for education announced some time ago that our public school system was not fulfilling its purpose, since our people, all over the country, were still as ready as ever to be fooled by the fake advertiser of every kind—the palmist, the get-rich-quick man, the patent medicine vender, and all the others of that ilk. Surely the reorganization of the teaching of hygiene on a proper scientific basis in our public schools would do something to get us rid of the present influence which the

quack medicine fakir continues to wield over so many of the supposedly intelligent population of this country.

At the present time public school text-books call attention to the evils of alcohol with unstinted zeal though no mention is made of the fact that practically all of the most advertised patent medicines, the best known and the most used, all the wonderful tonics are really nothing more than alcohol made properly bitter by the addition of certain pharmaceutical materials which serve to give them a definite medicinal taste.

In the improvement of public school systems now become the favorite study of our best educators surely this subject of the proper teaching of hygiene should receive its due share of attention. There are those closely in touch with the public school system who feel that there are many things now forced upon the occupation of children that are scarcely more than show subjects. The satire upon the high school graduate of a year or two ago by one of our best-known comic weeklies that he and she carried with them out of school the burden of many volumes of useless information is not without its share of truth. We are not of those who believe only in practical education, but surely the matter of individual and community health is one of those important practical subjects that every young person should be given the basic principles that underlie its preservation. We shall look for some true progress along this line, now that educators seem to have taken the matter up seriously.

### A NEW DEPARTURE.

IN these days when a gullible public prescribes for itself from the patent medicines on the frieze of the trolley-cars, or takes the profitable substitution that the druggist passes over the counter, it is no wonder that physicians feel a bit out of sympathy with the venders of drugs, and make unfavorable comparisons between the commercialism of the men who supply medicines and the science of the medical profession that prescribes them.

But we should never forget that were it not for the great manufacturers and importers of drugs we might still cull our own herbs, and use our own mortars and pestles. As an indication of the aid that such houses may be to physicians, we call attention to the colored plates of pathogenic organisms that have been prepared for the profession by the house of M. J. Breitenbach Co., the importers of Gude's Pepto-Mangan. By their permission we have inserted a few of the set of sixty in our advertising pages.

No text-book and no one work on pathogenic bacteria contains such a number of excellent diagnostic illustrations, nor such beautiful examples of lithographic art as these.

Many physicians are too far from libraries and laboratories to be able to put into practice the training of their college days. They need just such a set of reference plates to be able to make microscopical examinations. The recognition of this need and the care that has been taken to fill it shows a spirit of enterprise in this firm that we wish might serve as an example to others. For, if, instead of advertising to the public the manufacturers of drugs would make such valuable contributions to science as lies in their power there might be more sympathy between them and physicians.

The full set of sixty cuts has been prepared to send to any physician who writes for them, from the firm of M. J. Breitenbach Co., New York.

## ECHOES AND NEWS.

### NEW YORK.

**A Hospital for Consumptive Poor.**—The project of a tuberculosis hospital, to be founded by the City of New York for the treatment of incipient cases, on high ground back of the Hudson in Orange or Rockland County, appears likely of realization. The plan and scope of the scheme have been discussed in administration circles for several months and they may be laid before the Board of Estimate and Apportionment or come before the Board of Aldermen during the present month.

Mayor Low has all the details of the needs and capacity of the proposed institution from Commissioner Lederle of the Health Department, Commissioner Homer Folks of the Charities Department, and many scientific men. It was stated semi-officially that the hospital—land and buildings—would cost from $350,000 to $500,000, and would be under the control of the Board of Trustees of Bellevue Hospital.

**Tuberculosis Fakirs.**—The following from the *Herald* is worthy of preservation in medical literature as illustrating the methods of many similar institutions:

When the prosecution is ready to act in suppressing the many so-called "Koch" cure establishments purporting to be affiliated with Professor Robert Koch, the distinguished German tuberculosis expert, but which he has expressly repudiated no less than thirty times in letters sent to representative men in America, a mass of testimony will be ready. In addition to the data already prepared for the counsel of the County Medical Society, which has been investigating these so-called "Koch" lung cure concerns for nearly two years, it was learned last week that a former nurse at the West Twenty-second street establishment, who has also had experience at several other branches, has volunteered to tell some astonishing particulars about the manner of conducting business in these "consumption parlors."

This woman is now employed at a hospital in this city. She first entered the employ of the so-called Koch Lung Cure Company in Philadelphia, where a sort of training school for nurses is maintained by the parent office. Then she went to the Rochester establishment. Here is what she said when asked about her experience there:

"I had charge of the business department there. I received the patients when they first came to the office; I placed the advertisements, prepared the tuberculin and was the general supervisor of the office. I kept the books and banked the money most of the time."

"What was the treatment that was adopted in that office during the time you were there in charge?" she was asked.

"We got the tuberculin from the Koch Lung Cure office, No. 150 Nassau street, in little bottles containing about an ounce. This was used with six ounces of albolene. The albolene was colored for the consumption cases and bronchitis and the tuberculin that was used for asthma was plain white. We used alkanet root for coloring."

"How many patients were cured at that place?"

"None."

"How many ever gave testimonials as to being benefited or cured?"

"I think we got three who said they had been benefited, but never any that were cured."

This nurse was then asked about a letter which she said she had written by the direction of Wallace Cleveland Clark, M.D., the head of this particular so-called Koch Lung Cure Company, running as follows:

"We are interested in your case and want you to get well. We are glad to say that, through the generosity of a wealthy lady, whom we have cured, certain money has been placed at our disposal to assist deserving cases to take our treatment. Call soon, as we are making this same offer to others, and it will be a case of first come first served. Respectfully, K. L. C."

"What does 'K. L. C.' stand for?"

"The Koch Lung Cure."

"Was that the way Dr. Clark directed you to write the letter?"

"Yes."

"Do you know whether or not a generous lady, or any lady, was cured by the Koch lung cure and had deposited a sum of money for the purpose of benefiting other sufferers, as stated in this letter?"

"I can say positively that I know no wealthy lady was cured in Rochester and that there was never a dollar deposited for any such charitable purpose."

"What would you say, basing your statement upon your experience with the company while you were in its service, and from your observation, is the main object of the company in its advertisements?"

"To get money, to get rich, and absolutely nothing else."

"From what you know of your own knowledge concerning the company's mode of treatment and sale of medicine and general advertisements, would you state whether or not there is any virtue in its treatment and if it does humanity good or relieves the sick and suffering from consumption?"

"I would not take it myself."

"What do you say generally, based upon your experience?"

"I do not believe that it is any good."

Besides the testimony of this nurse, who has been in consultation during the last few days with Mr. Champe S. Andrews, the counsel for the New York County Medical Society, the method of the spurious "Koch" companies in obtaining testimonials has been investigated.

Here are extracts from a letter sent to a woman in Washington, D. C., signed W. C. Clark, the president of the concern:

"DEAR MADAM: You are probably aware of the fact that your testimonial has been inserted in the papers, and we realize that you are put to considerable trouble in answering letters and inquiries that come to you about your cure.

Should any one desire to have you call and see them at their home and you can spare the time, we would be very much pleased to have you do it. Of course, a dollar would be a very small fee for such a visit and we would be very glad to pay it. * * *

Kindly instruct us to answer them (the letters) for you and we will simply state that your case was cured, as stated in the testimonial. I believe that is all that is necessary. Hoping that you will take this in the spirit in which it is sent and will allow us to at least give you the amount that you would otherwise earn for the same amount of time, given, I mean, twenty cents per letter and twenty cents for each inquiry, I remain, very sincerely yours, W. C. CLARK."

This adroit scheme to obtain many alleged testimonials is said to have had an odd sequel, which may be brought out in the crusade of the County Medical Society against these impersonators of the German tuberculosis investigator.

## PHILADELPHIA.

**Tetanus Follows Toy Pistol Wounds.**—Seven deaths from tetanus have occurred during the three days preceding the writing of this letter. Of these five occurred in children, the wound in each case being caused by toy pistol. As usual the manufacturers and retailers of the fire-arms are blamed by the coroner, and the matter is allowed to drop. Efforts are being made in some of the laboratories of the city to determine if tetanus bacilli are lodged in any part of the ammunition used or if they are introduced into the wound from other sources. The results thus far have been negative.

**Crusade Against Smallpox Begun.**—Vigorous efforts are being made to prevent the spread of smallpox which has been increasing during the past two weeks. House to house vaccination is being carried out in the Twenty-eighth Ward which contains the greatest number of cases. The streets in those localities are to be flushed each day by the firemen. The Board of Health has notified the proprietors of stores that their places of business will be closed for fumigation whenever a case of smallpox develops. As a result the proprietors of two large department stores have notified their employes that all who have not been vaccinated within five years must submit to vaccination or be dismissed. There recently died at the Municipal Hospital a druggist who had been vaccinated unsuccessfully twenty-four times.

## CHICAGO.

**Appointment of Dr. Wm. L. Ballenger.**—Dr. William L. Ballenger has been elected to the Chair of Otology, Rhinology and Laryngology, made vacant by the resignation of Dr. Moreau R. Brown.

**Appointment of Dr. Frank Allport.**—Dr. Frank Allport has been elected Clinical Professor of Ophthalmology in the Northwestern University Medical School.

**Incorporation of Englewood Hospital.**—A new corporation has been organized, known as the Englewood Hospital and Training School. This will succeed the Englewood Union Hospital, which will surrender its charter. The new institution is not for pecuniary

profit. The plan contemplates the purchase of land for $20,000, on which will be erected a hospital building to cost $80,000, and to accommodate 148 patients, and this building will be equipped at a cost of $20,000.

**Effect of Hot Weather.**—Owing to the sudden onset of hot weather during the week ended July 4, 563 deaths were recorded, an increase of 109 over the preceding week, or about 24 per cent.

**Issuance of Permits to Hospitals.**—The Corporation Counsel has advised Health Commissioner Reynolds to issue licenses to general hospitals, even though neighboring property owners should object, serve written notice on the Mayor and Commissioner, and threaten suit for damages.

**Commencement Exercises of Jenner Medical College.**—Jenner Medical College held its graduating exercises June 30. Dr. G. Frank Lydston delivered the doctorate address on "The Young Man's Way to Success."

**Graduation Exercises of Harvey Medical College.**—This college graduated a class of 20 on June 27. Dr. Frederick D. Marshall presided, and Carl Svante Nicanor Hallberg, Ph.G., on whom was conferred the honorary degree of Doctor of Medicine, delivered an address.

**Northwestern Alumni Week.**—The exercises of alumni week at Northwestern University Medical School were attended by about 200 former graduates of the institution. Special clinics were held. At the banquet, Dr. Archibald Church acted as toastmaster, President James of the University welcomed the guests, and Hon. A. N. Waterman, Rev. I. A. White and Frederick Greeley spoke.

**Death of Dr. De Laskie Miller.**—Dr. De Laskie Miller died July 9, in this city. He was one of the oldest of Chicago's physicians, and had been prominent in the profession for many years. Dr. Miller was eighty-six years old.

## CANADA.

**Providing for the Ontario Epileptic.**—Woodstock, Ont., has been selected as the site for the buildings which the Ontario Government will erect for the care of epileptics in this Province. Accommodation will be provided for 100 patients, in all the best and most modern style. The institution will be extended as necessity demands.

**The Universities in Toronto Federating.**—It almost seems to be an assured fact that the 200 odd students of Trinity Medical College will be associated with the 400 medical students of Toronto University in the new medical building which has just been completed by the latter. The two medical faculties have already arranged the terms of union, and it but remains for the corporation of Trinity University to agree to federation. The scheme for federation between the two Universities has been laid before the Government, and it has met with their approval. Amalgamation has been most talked of between these two medical colleges during the past six months, and there are many who hope for the cause of medical education in Ontario, that the medical schools will open as a united body at the beginning of the next session.

**The Practice of Christian Science Gets a Setback.**—In November, 1901, at Toronto, a citizen was convicted of manslaughter on the charge that he had failed to provide medical attendance for his son, a boy aged sixteen years, who died from diphtheria. After the conviction had been secured at the Assize Court the matter was taken to the Court of Appeal, where the judgment of the lower court was confirmed. According to this decision it was found that there was sufficient evidence to warrant the verdict. This court also thought that the learned judge properly charged the jury that the word "necessaries" as used in the criminal code, includes medicine and medical treatment.

**Maritime Medical Association.**—It is now twelve years since this Association was organized at St. John, N. B. It will hold its annual meeting this year on July 22 and 23, in that city. One of the distinguished visitors who will attend and contribute a paper will be Dr. Maurice H. Richardson, of Boston, U. S. A. A paper on gynecology will be read by Dr. E. W. Cushing, also of Boston. Dr. G. E. Armstrong, of Montreal; Dr. F. A. L. Lockhard, of Montreal, and Dr. G. J. Evans, of Montreal, will all three be present and contribute papers.

**Ontario Medical Council.**—The Ontario Medical Council has been meeting in Toronto during the past week. The following officers were elected for the ensuing year: President, Dr. J. A. Robertson, Stratford, Ont.; Vice-President, Hon. Dr. Sullivan, Kingston, Ont.; Registrar, Dr. R. A. Pyne, Toronto; Treasurer, Dr. H. W. Aikins, Toronto. A great deal of discussion took place upon the report of a special committee on legislation which suggested amendments to the Ontario Medical Act, which would be beneficial and timely both to the public and the profession at the present time. The Ontario Government will be memorialized to more clearly define what constitutes the practice of medicine. The object of this is to protect the public from the surfeit of quacks and healers which infest the Province at the present day.

**The Montreal Antituberculosis League.**—The investigation committee of the Montreal Antituberculosis League held a meeting one afternoon during the past week which was presided over by Dr. Roddick, M.P. Dr. Harding was appointed permanent secretary for the committee. A number of physicians representing the outdoor departments of the various city hospitals and dispensaries of Montreal were present and discussed with the Committee the cooperation of these institutions with the League. Each hospital representative addressed the meeting and reported that the institutions they represented would be willing and glad to cooperate with the League in reporting cases of consumption that came under their notice. Arrangements were completed, whereby each hospital would fully report the tuberculous cases coming under its care. This will greatly aid the League in its efforts to obtain information concerning these cases in the city and give them great opportunities in trying to stamp out the disease.

**Royal Jubilee Hospital, Victoria, B. C.**—The annual report for the year ending May 31, 1903, of the above hospital is as follows: The total number of in-patients treated this year was 784; the total number of out-patients 163; as against last year in-patients 782; out-patients 122. The total collective days' stay was 17,628, as against 17,531 for last year. The daily average number of patients in the hospital this year was 48.108, as against 47.27 last year. The cost of maintenance was $31,881.17, while the daily average cost per patient was $1.80. The Medical Superintendent urged increased accommodation for private patients.

**The Retirement of Dr. W. B. Geikie.**—Dr. W. B. Geikie, who for many years has been Dean at Trinity Medical College, Toronto, and Professor of Medicine in that institution, has resigned from both positions and will cease the active teaching of medicine. Dr. Geikie was well known as one of the most prominent teachers in medicine since 1856. He became dean of Trinity Medical College in 1878, a position which he has held for 25 years, and the great success which has attended that school of medicine was due in a great measure to his unceasing energy in its behalf. Dr.

Geikie has been succeeded as Dean by Dr. J. A. Temple, who is Professor of Gynecology in the same institution. Dr. Temple has also been appointed to represent the College on the Ontario Medical Council.

**A New Hospital for Vancouver, B. C.**—Vancouver will erect a fine new modern hospital to accommodate at the present time 100 patients and providing for the necessary executive offices. Toward this end the citizens have subscribed $30,000. The city has given $20,000, and the Government of British Columbia will contribute $20,000 in addition to these sums. Plans are under consideration for a building capable of being enlarged to provide for at least 300 patients, with all the appurtenances of a modern hospital.

## GENERAL.

**Appointment of Dr. Müller.**—Dr. Frederick Müller of Chicago, at one time assistant to Dr. Adolf Lorenz, of Vienna, has been elected Professor of Orthopedic Surgery at the Milwaukee Medical College.

**New Honors for Dr. Hemmeter.**—Dr. John C. Hemmeter has been elected to the Professorship of Physiology in the University of Maryland, of which institution he is a graduate, as well as of Johns Hopkins University and the Royal Gymnasium at Wiesbaden.

**Smallpox Hospital Burned in Orange, N. J.**—Fire on July 2 destroyed the main structure of the group of buildings, erected at Heywood and Mosswood avenues in Orange at the time of the smallpox outbreak about two years ago and used as an isolation hospital, entailing a loss of $2,000. It was with difficulty that the firemen prevented the destruction of the other buildings, as there are no hydrants nearby and the fight had to be made with the chemical engine. Both Health Inspector William Schluer and Fire Chief Hodgkinson think the building was set on fire.

**Berlin Medical Society Reports on Tuberculosis Experiments.**—The Berlin Medical Society assembled on July 8 to hear Prof. Kossel of the Imperial Health Office report the results of the prolonged experiments of the Tuberculosis Commission in infecting calves with human tuberculosis. Prof. Koch's observations, prior to the celebrated London address, caused the Health Office to appoint the Commission to make systematic experiments. Yesterday's paper was in the nature of a preliminary report. The Commission's investigations cover three forms of introducing tubercle bacilli in calves—first, subcutaneous injection; second, in food, and third, by inhalation. The preliminary report covers only the first form, but the experiments with the other forms continue.

The Commission decided to attempt the inoculation of calves not with matter taken directly from human victims, but with cultures made therefrom. The experimentation covered 39 separate cultures, 23 from adults and 16 from children. The results were that 19 calves subcutaneously treated did not show the slightest effect, 9 showed, after four months, the slightest changes of condition, and 7 showed more marked symptoms, but the propagation of tuberculosis in the body did not occur. On the other hand, 4 inoculations from tuberculous children infected calves with a disease which resembled a weak type of animal consumption, and 2 of this number died from tuberculosis. The Commission summarizes as follows: "The series of experiments strengthens Prof. Koch's view that animal consumption as the cause of human consumption does not play the rôle generally attributed to it, but definitive judgment requires further experimentation." In the discussion which followed Prof. Orth, the late Prof. Virchow's successor, strongly combated the view that human and animal consumption were dissimilar and non-transferable.

**State Medical Licentiates.**—The annual meeting of the State Board of Medical Examiners of New Jersey was held at Long Branch, July 6. The following candidates, who passed the State examination held at Trenton, June 16-17, were granted certificates of license to practice medicine in that State: Leon Hamilton Bossert, Millville; Arthur W. Belting, Trenton; Joseph Howard Cloud, Ardmore, Pa.; Francis R. Di Matteo, Newark; John Edward Donley, Jr., Orange; Harry Stokes Doriss, Atlantic City; Joseph William Dwyer, Passaic; Edmund Eastwood, Burlington; Walter Roland Elliott, Philadelphia; Mary E. Esser, Philadelphia; James Aloysius Gormley, Vineland; Earl Stephen Hallinger, Camden; Pomp. Long Hawkins, Atlantic City; Charles R. Heed, Philadelphia; William Thomas Hilliard, Jr., Salem; Howard Franklin Hoffmeier, Phillipsburg; Smith Hamill Horne, Atlantic City; Charles Albert Keating, Jr., Paterson; Raymond Arndt Kiefer, Midland Park; Joseph William Kenney, Philadelphia; John William King, Jr., Newark; Edward Isaac Leonard, Atlantic City; Fred Irvin Longstreet, Manasquan; John Carmelia Loper, Bridgeton; Harry George Macdonald, Hackensack; Calvin Edward MacMillan, Lakewood; Emil Mantner, Newark; Harold Philip Martin, Newark; Thaddeus P. Martin, Atlantic City; Charles Holmes Mayhew, Port Elizabeth; Dennis Ralph McElhinny, Long Branch; Frederick W. A. Mayer, Jersey City; John Lewis Meeker, Newark; James Percival Morrill, Paterson; Edward Ralph Myers, Atlantic City; Marcus Ward Newcomb, Newport; Jeremiah Francis O'Connor, South Amboy; T. Richard Paganelli, Hoboken; Edward Parry, Camden; Thomas Heritage Platt, Jr., Bridgeton; Jacob Wilson Reed, Pleasantville; Siegmund Albert Reich, Jersey City; Joseph England Roberts, Jr., Camden; Edward Bancroft Rogers, Mt. Holly; Horace Lewis Rose, Camden; Israel Jay Rachlin, Newark; William Satterer, Newark; John Berkey Seeds, Trenton; Frank Remington Sheppard, Cedarville; William Rice Silverstein, Newark; Howard Sedgwick Smith, Newark; Katherine Louise Storm, Philadelphia; Edmund Brewster Terry, Atlantic City; Claude Wellington Thomas, Medford; William Hibbs Tomlinson, Trenton; Helen Frances Upham, Asbury Park; John Van Ess, Paterson; Joseph Smith Van Dyke, Cranbury; William John Ward, New Brunswick; Victor Egbert Watkins, U. S. Army; Absalom Steelman Wescoat, Atlantic City; Herbert Heisler Wilson, Bridgeton; Emanuel Yadcowsky, Newark; J. John Lee Young, Newark.

The following candidates, having attained a general average of 90 or over, were placed on the Honor Roll: Francis R. Di Matteo, Newark, 92; Jeremiah Francis O'Connor, South Amboy, 92; Howard Franklin Hoffmaier, Phillipsburg, 91.1; Joseph England Roberts, Jr., Camden, 91.1; Joseph Smith Van Dyke, Cranbury, 91; James Percival Morrill, Paterson, 90.6; John Edward Donley, Jr., Orange, 90.1; William Satterer, Newark, 90, and William John Ward, New Brunswick, 90.

**Medicine as a Profession in Austria.**—The Medical Congress recently held at Vienna revealed a sorry, and at the same time anomalous condition of affairs in the Austrian empire. Twenty thousand communities, or 86 per cent. of all, are so poor that they cannot afford regular physicians, and 30 per cent. of the dead (in Galicia 75 per cent.) are buried without medical certificate. Yet, while there is such need of doctors, the number of medical students is decreasing at a surprising rate. Of every 1,000 students in the Austrian universities this year, only 132 are in the medical departments. The total number of medical students is

only 2,120 as against 5,277 in 1888-89—a decrease of about 60 per cent. in a little over a decade. And the decrease is likely to continue. At the congress referred to, Dr. Wichmann earnestly warned all young men against choosing the profession of medicine; which, he declared, the Government had practically killed by its faulty laws in favor of the laboring man. Other speakers dwelt on the same point. They were not opposed to compulsory insurance against illness as such, but to the manner in which it is managed and to the abuses to which it has given rise, and which call for prompt remedies. From the country communities good physicians have long been excluded, because they cannot be supported there, and now that already one-third of the Viennese are taken from private practice by the Krankenversicherung and its underpaid employees, the outlook in the cities becomes hopeless, too. Quackery naturally increases under such circumstances, and the medical man's resources are further cut off by the fact that, thanks to his own hygienic reforms, the number of cases of illness is now little more than one-half of what it was twenty years ago.

**Deficit in Cod-liver Oil Supply.**—From private correspondence it is learned that there is likely to be a very great scarcity in the supply of cod-liver oil during the coming fall and winter. One of the largest and most reliable refiners of this product reports that it is becoming almost impossible to secure it at any price, and thinks his concern will have to suspend operations for several months. Heretofore most of the commodity has come from Norway, because of its exceedingly high-grade quality and relative cheapness, but under present conditions, although quite as many cod are available in that country as formerly, it is found that the livers contain either no oil at all or too small a quantity to be made use of. The reason for this deficiency is unknown, but has been supposed by some to be due to the volcanic eruptions and other seismic disturbances which have occurred during the past year, since these are known to interfere with the procuring of proper food by fish of the cod type. This, however, is an extremely doubtful explanation.

The oil obtained from the Newfoundland cod is not of as good quality, is scarcer, and costs $200 to $250 a barrel, whereas the Norway oil has been obtainable in past years for about $40.

**Bound in Human Skin.**—It may not be generally known that the late Dr. F. Stockton-Hough, of Trenton, N. J., who left a valuable medical library in several languages, had a fancy for bindings made of human skin. He owned at least six books thus bound. One of them, "Catalogue des Sciences Médicales, Bibliothèque Nationale à Paris" (1857-73), is a large, very thick quarto half bound in skin from the back of a man. The texture is quite coarse and does not even suggest human skin. On the fly-leaf of a second book, "Cowper on Impregnation" (1789), the owner wrote: "Bound in leather tanned from the skin of the thigh of Maria L., affected with encysted trichinæ, who died of consumption in the Philadelphia Hospital. She was an Irish widow, aged twenty-eight years." Maria L. furnished the binding for another book also: "Das Buch der Liebe, oder das Geschlechtsleben in seinem ganzen Umfange." A valuable private library in New York contains a fourth book, presented by Dr. Stockton-Hough to the owner. This third piece of the leather-tanned skin of Maria L. is Barles's "Parties de la Génération." "Recueil des Secrets de Louyse Bourgeois," the famous French midwife, a 12mo, is the fifth book, also bound in the skin of Maria L. The sixth, Drelincourt's "De Conceptione Adversaria," a 12mo, is half bound in tattooed skin from the wrist of a man who died in the Philadelphia Hospital. Dr. Stockton-Hough tanned the skin himself in every case. That taken from the back, where the muscles are well developed, is coarse-grained; that from the thigh resembles pig-skin so much that the novice could not call it correctly by name. These books are now in the Medical Library of the Philadelphia Hospital, of which the Stockton-Hough collection is now a part.—*The Critic.*

**Anthropological Society of Washington.**—The 347th Meeting was held May 12. Dr. J. Walter Fewkes, who recently returned from the West Indies, gave a brief account of his work in Porto Rico and Santo Domingo, reserving a fuller presentation till next meeting. The paper of the evening was by Dr. E. A. Spitzka, entitled "Cerebral Characteristics of Distinguished Men, with special reference to the late Major J. W. Powell." Following is an abstract: Dr. Spitzka reviewed previous records of brains of distinguished men and proceeded to a consideration of their chief characteristics, particularly the brain-weight and the surface morphology—both generally and with special reference to certain cortical areas. Dr. Spitzka had tabulated the brain-weights of ninety-seven men eminent in the professions, arts and sciences; compared with the series of "ordinary" brain-weights collected by Bischoff and Marchand, there was a relatively and decidedly greater number of heavier brains in the former series. In a further analysis it was shown that the brains of men devoted to the higher intellectual occupations, such as the mathematical sciences, involving the most complex mechanisms of the mind, those of men who devised original lines of research (Cuvier, Cope, Agassiz) and those of forceful characters like Ben Butler or Daniel Webster possess the heaviest brains. The increase in brain-weight during evolutionary progress is directly related to the increase of cranial capacity along with the development of brachycephaly. As for the cerebral surface appearances, the highly intellectual man is likely to exhibit not only a superior degree of fissural and gyral complexity in general, but of certain cortical fields in particular. These differences in the extent of certain cortical (especially the associative) areas are palpable and measurable. Particularly important in this relation is the insula (Island of Reil), probably the purest association center in the brain, and usually showing a superior degree of development in men whose powers of speech were of a high order. The brain of Major J. W. Powell (to be described in the *American Anthropologist*) exhibited a decidedly superior degree of development. Its weight, 1,488 grams, was above the average of the 97 brains of eminent men, and for a man below medium stature and of rather small frame and whose age was 68, it was notably above the average. The most notable feature is a redundancy in the subparietal association area (especially the angular gyre) on the right side, a feature which may not be unrelated to an important characteristic of Major Powell's mental make-up: that of keen observation and superior powers of generalizing these. A large number of charts and figures of brains of notable persons illustrated the paper.

In discussing the paper Dr. Frank Baker held that the convolutionary pattern of the brain is due to the needs of motor activity, and any conclusions from it as to brain power should be carefully weighed.

Professor W. J. McGee stated that Major Powell's strength lay in generalizing on observations in nature and that the address of Dr. Spitzka shows that it is now possible to trace a definite relation between cerebral structure and the psychical character of an individual. Dr. Ales Hrdlicka said that it is a well-known fact that every organ in the body, if more than

ordinarily exercised, receives an augmented blood-supply and in consequence tends in time to increase in size and weight. It would be very strange if the brain formed an exception to this law. It is true that the efficiency of a brain may increase by the advance of the differentiation of its minute elements, but in all probability this and actual growth go hand in hand, and the size and weight of the brain must be of considerable importance in the study of the organ. That no very definite results in this respect have as yet been generally arrived at is due to the fact that we are practically only in the beginnings of brain study and need many additional accurate data on normal material, and that not only in white but also in various more primitive peoples. We need many further data on the significance in brain study of race, sex, stature, muscularity, age as well as other factors. The significance of the convolutionary pattern is particularly in need of further investigation, yet it is a general opinion that a marked complexity of the convolutions goes with the superior brain and vice versa. Dr. Hrdlicka expressed a hope of establishing in the course of time a valuable brain collection in his division in the U. S. National Museum.—*Science.*

**Obituary.**—Dr. Thomas M. Rochester, who had practised in Brooklyn for twenty-five years, died on Sunday of consumption in the home of his mother, in Rochester, N. Y. His great-great-grandfather, Col. Nathan Rochester, was the founder of that city and some of his descendants have lived there ever since. Dr. Rochester settled in Brooklyn soon after his graduation from the Buffalo Medical College, and remained in practice there until the breaking down of his health, three years ago. He was prominent in the various medical organizations in Kings County and a member of the Oxford, Marine and Field and Reform clubs.

## SPECIAL ARTICLE.

### BYWAYS OF MEDICAL LITERATURE.—XV.

#### AN AMERICAN MEDICAL INCUNABULUM.

WHILE in New Orleans we had the pleasure of seeing what is surely one of the most precious bibliophilic treasurers of American medical literature. It is a true incunabulum of medical printing in America, being the first book ever printed and published in New Orleans. It is in the possession of Mr. T. P. Thompson, whose choice collection contains more of the important Americana relating to old Louisiana before and after its acquirement by the United States than any other private library in the country.

The book is a little work on medicine whose title is Medicamens et Precis de la Méthode de Mr. Masdevall Docteur Médecin du Roi d Espagne Charles IV. pour guerir' tautes les Maladies Epidemiques, etc.—that is Remedies and a Brief Description of the Methods of Mr. Masdevall, Doctor in Medicine to the King of Spain, Charles IV., for the cure of all epidemic diseases. As the little book contains less than 100 pages the assumption that it contains remedies for all epidemic diseases is a striking assurance on the doctor's part. This is not all, however, for the title proceeds—and for the cure of putrid and malignant fevers of different kinds and for protection for them. Price, four escalinos. To be obtained at the establishment of Louis Duclot, Printer, at New Orleans, 1796, with permission of the government. The dedication is to Baron Carondelet, the Spanish Governor, at the time.

The most curious thing about the book is the utter confidence with which the author promises that his remedies will cure, not alone relieve, but absolutely cure, the severest forms of fevers. The modern physician is at once tempted to find out, if possible, what are the precious ingredients of these wonder-working prescriptions. He is scarcely surprised, however, to find that they are only ordinary drugs, most of them now used very commonly in so-called family remedies; practically all of them inert, though there is an appeal to antimony in various forms, on all possible occasions, that shows the desire of the doctor to give and the wish of the patient to take something that would have an immediate and striking (not to say moving) effect. Tartar emetic, butter of antimony and the antimonial mixture were evidently the old doctor's standbys in the treatment of fever, though there is also an opiate febrifuge that was apparently often prescribed. Cream of tartar was employed at the beginnings of fevers partly for its laxative and partly for its diuretic and diaphoretic effects. The practice of using it thus has not gone out yet, among the older physicians of the South especially, and might well be imitated by their younger colleagues. Among the simples employed for colds and the combination of which was guaranteed to be a sure cure for consumption (when did they not have a cure for consumption—in spite of the mortality) was a mixture of the decoction of coltsfoot, of the wild poppy, of creeping ivy (hedera terrestris), of maiden hair fern, and the finest honey. Curiously enough, the time for special medication in Dr. Masdevall's opinion was not the spring of the year, but the fall. After all, perhaps, it is not surprising that it was after the oppressive heat of the summer rather than their pleasant winters that the inhabitants of old New Orleans felt the sluggishness that is supposed to be an indication for active medication. The ingredients of the autumn medicine were the inevitable antimonial mixture some Rosolidi Kina (a mysterious drug of a century ago) and syrup of vinegar. The old doctor's confidence in his remedies must have been one of the most effective factors in the treatment of his patients if he really effected the cures he claims so glibly to be the sure result of his wondrous prescriptions.

#### AS OTHERS SEE US.

AMERICAN publications of all kinds have taken the occasion to say so much about Prof. Lorenz during the past few months, because of his pleasant visit to us, that it is not surprising to find that the good Doctor had something to say of us on his return to Vienna. At a meeting of the Doctors' Club, of Vienna, he made some remarks as to the peculiar customs he had noted in America. He deprecated especially the notoriety that had been given to him, since it prevented his moving around as freely as he would otherwise like to have done, since everywhere he went he immediately became the subject of remark. He had to deny himself the theater almost completely, though with true Viennese Gemüthligkeit he would have liked very much to have gone frequently.

One of the customs he found most difficult to understand in America is our habit of having our shoes shined in public. As the correspondent of one of our prominent New York dailies said in comment: "To the fact, or to what he thought was the fact, that we generally have this operation performed while the shoes are on our feet, he devoted almost as much space as to anything else he saw over here; which shows that a trifle that never would have entered our thoughts struck him as a most curious and interesting novelty. 'I have often,' he writes, 'put the question to Americans, why, if time is money, is it absolutely necessary for me to be present every morning when my shoes are being cleaned?' I would say: 'Why must I have my shoes on my feet when these are being cleaned and thereby unnecessarily lose a quarter of an hour's time?' The answer would be: 'Yes, it is curi-

ous, but that is the custom.' The dear personnel of the hotel had other things to do of greater importance. If you want to have your shoes cleaned you must go to the negro, or clean them yourself. Therefore, I would advise every one who intends to visit America to supply himself in advance with the necessary utensils for shoe cleaning, if he prefers his independence to his convenience. Then follows the queer statement that 'it may be interesting for the visitor to the University Club'—what University Club not specified—'to know that the cleaning of a pair of shoes in America is dearer than a dinner in this club. It is easy, therefore, to compute how quickly under such circumstances the cleansing would exceed the original cost of the shoes. Cleaning shoes is no bad business in America, and supports a man well.' Apparently the good doctor was very savagely 'touched' by the bootblack at some club, and acquired some wrong ideas therefrom. But, come to think of the matter, it certainly is strange that such a vast amount of valuable American time should be wasted in the way that troubled Dr. Lorenz, and, thinking again, there has been an unrecorded change of late years in the shoe-cleaning habits at hotels, if not in homes."

All of which goes to show that sometimes we need to see ourselves as others see us, if we would behold the real selves. Physicians must feel our absurd time-wasting custom in this matter more than others. Why should it continue?

### THE SACRAL SPOT IN CERTAIN RACES.

THOSE who are interested in the occurrence of various malformations and peculiarities in the sacral region will be attracted by the results of some observations of Frederic Starr among the Maya Indians in Mexico. It is well known that among the Japanese and other populations of the East as well as the Esquimaux and certain of the Chinese of the northeastern part of China, a distinctly pigmented spot exists over the sacrum in all children. This disappears sometimes during the course of the first year and practically always before the child has reached the age of two years. It is understood to be the result of the closing in of tissues over the cleft that exists in this region in the embryo and whose imperfect closure leads to the many anomalies that are known to occur over the sacrum.

Mr. Starr said that it is a tradition that every pure-blooded Maya Indian has a blue or purple spot upon his back in the sacral region. Observation among adults, however, failed to show its existence. An opportunity was presented to examine a number of children and in the series of cases the spot was found in every subject of pure Maya blood. The spot was not found, curiously enough, among mestizos, that is those of mixed blood. It is very evanescent among the Mayas, being very rarely found among individuals of more than ten months of age. The spot is variable in size, shape and position, but is always in the sacral region. In color it is blue or a bluish purple. The whole subject is interesting as showing some explanation of the many pigmentary and hirsute anomalies found among other races.

### VIVISECTION AND MORAL PRINCIPLES.

IN the April number of *The Messenger* (New York), there is an article with the title "Is Vivisection Morally Justifiable?" which discusses the moral principles underlying the employment of animals for experimental purposes in order to obtain information with regard to disease and its prevention and cure. The article is written by Rev. Charles Coppens, S. J., the author of a text-book on Moral Principles and Medical Practice, and a lecturer on medical ethics at the medical school of Creighton College, Omaha, Neb. The article contains an excellent résumé of the objections urged on supposedly moral grounds against the practice of vivisection and shows the lack of basis for antivivisection argument. For those who are interested seriously in the subject, and who sometimes wonder whether there may not be some truth in the frequently asserted claim that vivisection is cruel and in itself immoral, the article will present a very satisfactory answer to doubts and difficulties.

Professor Coppens begins his statement of the subject by quoting the letter of Professor Keen, of Philadelphia, addressed to Senator Gallinger, and which stated the ground on which the medical profession demand that no bills shall be introduced into Congress limiting the practice of vivisection because of the hampering effect which such legal regulation would have upon the progress of medicine in this country, as it has already had in England. There is after this a very fair statement of the ethical objections usually made to the practice of vivisection with the answers to them. The Rev. Mr. Coppens' conclusion is as follows:

"Such appeals to sentiment rather than reason are constantly met with in antivivisection literature; but they are an unfair presentation of the real state of the question. While it may be pleaded that even one man's life is worth the sacrifice of many brutes—according to the saying of the gentlest of teachers, "Are you not of much more value than they?"—there is a stronger plea than this. For the purpose of vivisection is the saving of thousands and myriads of men from sufferings more exquisite than any brute can undergo; for mental anguish is far more painful than physical hurt. Let any sensible man compare in his mind the suffering and death of a horse or a dog, with the scene presented by the death-bed of a father or mother of a family, with the prospect of leaving the children orphans, and exposed to the ills of poverty and moral neglect, or the contagion of bad example. Then let him consider how many persons have been rescued from the approach of death by the assiduous labors of learned physicians who, but for vivisection, would have been powerless to afford assistance. There are living to-day countless poets, artists, statesmen, doctors, soldiers, clergymen, magistrates, etc., and multitudes of mothers of families whose lives would have been lost in sickness, or by wounds, or in the labors of childbirth, if vivisection had not furnished the knowledge which enables medicine to prolong their lives."

### PARASITES AND PEARLS.

RECENT investigations have shown that most of the calculous formations within the human body are due to morbid processes set up by the presence of bacteria. It is now generally accepted that practically all the biliary calculi are due to the presence of bacteria and these bacteria can even be recognized by staining and other methods in the center of the calculus. In fact, calculi have been produced in animals by the introduction of bacteria into the gall-bladder. Pancreatic calculi are also thought to be due to bacterial action. The various calcereous degenerations within the body are also now recognized to be the result of the chronic inflammation due to the presence of bacteria and nature's conservative effort in effectively walling off such micro-organisms so as to prevent their getting into the lymphatic or blood circulation.

Some recent observations reported in the English scientific weekly, *Nature*, seem to show that the formation of pearls instead of being due, as has been thought, to the presence of any irritant, are due to a specific parasite which, after having gained an entrance into the shell of the pearl oyster, sets up a special irritation that results in the deposition of the pearly material in the globular shape so familiar to the lover of jewelry. Other irritants, it is well known, will cause the deposition of

this material but never in the beautiful form which it takes as the result of the presence of the parasitic worm described by recent observers. The Japanese are accustomed to obtain little pearly images of Buddha, by depositing metal models of the god in the shells of pearl oysters but these are scarcely more than pearly in appearance and cannot be spoken of as true pearls. The present discovery will, it is said, revolutionize the pearl-fishing industry by making it possible directly to control the formation of the precious stones on the fishing beds.

NUTMEG AS POISON AND ABORTIFACIENT.

AN English practitioner recently reported a case in which a whole nutmeg was taken with the idea of producing abortion or at least bringing on menses delayed in a case with suspicion and fear of pregnancy. The result was severe symptoms of narcotic poisoning. His communication is worth giving in brief, for its interest. We quote it from Squibb's *Ephemeris*, Vol. VII., No. 1, 1903: "Quite recently I was called during the night to see a young woman who was stated to be 'in a fit.' I found her in a collapsed condition, muttering unintelligibly; her extremities were clammy, her pulse was hardly perceptible, and her pupils were somewhat dilated and reacted feebly to light. The symptoms were suggestive of alcoholic poisoning but her breath smelt unmistakably of nutmeg and I then elicited that she had taken a whole nutmeg, grated, in a wineglassful of gin an hour or so previously. On asking her friends why she had done this I was told that 'she was so afraid of having another child.' It appeared that the catamenia had been delayed two weeks and, dreading pregnancy, she had taken the advice of some female friend with the result above mentioned. I afterward made some inquiries and learned that there is a prevailing impression among the domestic servant class that nutmeg is an emmenagogue, although such a large dose is perhaps unusual. Her general condition improving I contrived to empty her stomach of its contents. She remained in muttering delirium throughout the night and slept heavily nearly all the next day, when she awoke apparently recovered. The catamenia followed accompanied by much pain.

The impression that nutmeg and, curiously enough, this time, too dissolved in gin, is an abortifacient is evidently not confined to England, for in the London *Lancet*, Vol. I., 1902, p. 1798, Dr. S. Maberly Smith, of Geelong, Victoria, Australia, reports a similar case. As it is not unlikely that the tradition in this matter has penetrated also into America, we quote the details of the Australian case also:

"Some years ago I was called to see a woman who had taken the whole of a ground nutmeg mixed with gin. The symptoms were exactly the same as those described by Mr. Pitter, and the woman nearly died. The dose was taken to procure abortion; whether it had that effect I did not learn. The friends volunteered the remark that the woman had taken the nutmeg in spite of the fact that a neighbor had nearly died from the same cause shortly before. At the time I asked a good many friends, medical and lay, if they knew anything of the poisonous properties of nutmeg in large doses. None of them did except one old lady from the north of England, who stated that she and people in her part knew them well. Squire states that nutmeg in large doses is a narcotic poison."

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**Typhoid at Ithaca.**—Following the energetic work of Dr. Geo. Soper on the water supplies of Ithaca, typhoid had been practically eradicated. This week, however, some new cases have developed, and at the present time there are 9 patients with the disease.

## SOCIETY PROCEEDINGS.

### NORTHWEST MEDICAL SOCIETY OF PHILADELPHIA.

*Stated Meeting, held May 5, 1903.*

President, Wm. Egbert Robertson, M.D., in the Chair.

**Treatment of Tapeworm.**—This was the subject of the paper read by Dr. Samuel P. Gerhard, in which he called attention to the three specimens which were most commonly met with, *i.e.*, the beef tapeworm or *Tænia sagiyata*, the pork tapeworm or *Tænia solium*, and the broad tapeworm or *Bothriocephalus;* the former being the one most commonly met with in this country. He called attention to the necessity of thoroughly cooking the meat before it is eaten, which, together with cleanliness on the part of those engaged in handling it, and systematic and regular inspection of the cattle and the meat after it is in the market, he believed would materially decrease the number of cases of this condition. He remarked upon the difficulty in removing the worm and considered that the treatment which was applicable to worms of one character was applicable to all. The preparation of the patient prior to the administration of the remedy he considered a most important factor. The patient should be required to fast for twenty-four hours before the medicine is administered, during which time the bowels should be thoroughly emptied by means of purgatives. Among the drugs mentioned were the male fern, kouso (the latter being liable to produce severe nausea and vomiting in some cases), the bark of the pomegranate, together with its alkaloid, pelletierine. The last two, however, are very impalatable and may produce toxic effects in doses large enough to be effective. Oil of turpentine was formerly used to a great extent, but owing to its nauseating taste and difficulty of administration has somewhat fallen into disuse. Kamala is a very active drug, but its use is contra-indicated, because it causes nausea and vomiting in many instances. Powdered pumpkin seeds were thought to be a valuable and harmless remedy, especially in children. He emphasized particularly the importance of removing the whole worm in all cases, as if the head or any of the segments remain it will develop again in from six to eight weeks. He believed that the great drawback to the administration of many of the remedies was the very large dose required, being in some instances as much as a pint of a bitter, nauseating liquid, to be taken at one or two draughts, necessitating loss of time, and being a very serious matter with a weak and debilitated patient. He reported a method which he had found very satisfactory. The patient is instructed to thoroughly clean out the bowels by purgatives the day previous to the administration of the remedy. In the morning, as early as possible, a 20-grain capsule of pelletierine tannate is given, and after this has operated fully, which is usually in about two or three hours, the following prescription is administered:

Olii Resinæ Aspidii.....drams, ij
Ether.....drams, ij
Hydrargyri chloridi mitis...grains, xij

This is divided into sixteen capsules and one given every ten minutes, no food being taken. In about two or three hours the worm will be expelled whole with its head intact. He stated that he had recently employed this method in seven cases with very satisfactory results, the depression is generally very slight and does not last longer than two or three hours, and if it does exist, light food can be administered after the worm is expelled.

**Intestinal Parasites.**—Dr. L. Napoleon Boston gave a microscopic exhibition of intestinal parasites,

consisting of the beef worm, *Trichina, Echinococcus* and *Anchylostoma*, the latter being the parasite which is supposed to be the cause of the anemia among the bricklayers and other people of the lower classes, in many instances, and which examination of our army in Porto Rico revealed that 30 per cent. of all the cases of anemia were due to this parasite.

Dr. A. C. Morgan, in discussing these papers, stated that he had used the remedies recommended therein with very satisfactory results. He believed that a positive diagnosis of tapeworm should not be made, unless the segments were found in the stool, although the larva are not discoverable there. He referred to the predisposition of the embryo of various worms to lodge in the pectoral muscles, the biceps, the diaphragm and particularly under the tongue, and in a patient suffering from what is apparently muscular rheumatism, but in reality larva, there will be irregular temperature, some fever, and increased pulse. Interference with the action of the diaphragm, tenderness of the various muscles and symptoms of pleurisy are also important diagnostic symptoms. He believed that the oil of turpentine was contra-indicated if the kidneys were not in perfect working order.

**Difficulty of Diagnosis.**—Dr. Samuel Wolfe referred to the difficulty of diagnosis of this condition, as the various forms of intestinal parasites do not give rise to particular symptoms, and the conclusion can probably only be positively reached after seeing a worm, and the condition may exist for a considerable time without any being passed. He felt that they were more apt to occur during some acute infectious disease, or some decided constitutional disturbance, especially when the disease has assumed the malignant form, he having observed in several instances during the infection worms were passed in very large numbers. In cases of tapeworm, he believed, if the worm was of any size segments would usually be discoverable in the stools.

Dr. Luther C. Peter referred to a publication which he had recently read attributing the poisonous effects to the castor oil, which was administered in most cases.

Dr. Gibbon reported the case of a child, who during the three or four months previous to the passing of segments had been given raw Hamburg steak. He also referred to a case which had come under his observation in the Children's Hospital, where a child was seized with coughing and the nurse removed one or two large worms from its mouth. He believed that the migration of the worms was particularly common in typhoid fever, in some cases causing the perforation.

Dr. Harry Lowenburg reported the case of a Polish child which was brought to him a short time ago suffering from hematemesis. Being familiar with the fact that these people fed their children on raw pork, he at once administered an emetic, which was followed by the vomiting of a large round worm, about four inches long, after which all the symptoms disappeared.

Dr. Charlott reported the case of a girl operated upon in the German Hospital, after which she vomited a large number of worms.

Dr. Arthur P. Hitchens suggested the possibility of the remedy being absorbed before it reached the intestinal tract unless it was given in capsule form, which method he believed would be the most efficient.

Dr. Wm. Egbert Robertson recommended the more frequent examination of the stools, which he believed would lead to the detection of the ova of the round worm in many instances. While the flat worm is rare in children, he referred to a case reported by Dr. D. J. Milton Miller, occurring in a child eight months old, which was supposed to be infected by feeding it on expressed beef juice.

Dr. L. Napoleon Boston, in closing, stated that in cases of trichina there is always a swelling and pain in the frontal region. He believed that the *Oxyuris vermicularis* was quite as common in adults as in children, and while the habits of the patient may have a great deal to do with its occurrence, he did not feel that the social class had. Examination of the rectal mucus prior to the commencement of treatment was recommended in all cases.

Dr. Samuel P. Gerhard believed that many cases were diagnosed as *Tænia solium*, which in reality were worms of a different character. He believed that the reason this condition was not so prevalent in this country was due to the fact that people had been taught to cook pork thoroughly, while they eat raw beef, which accounts for the more frequent occurrence of that variety. Ether he believed to be of value as it tended to stupefy the worm and in that way facilitate its removal, and he also felt that it was important that the worm should be passed into a vessel of warm water, as if the temperature is lower than that of the intestinal tract it is liable to recede.

*Stated Meeting, held June 2, 1903.*

The President, Wendell Reber, M.D., in the Chair.

SYMPOSIUM ON EPILEPSY.

**"The Treatment of Epilepsy"** was the title of a paper read by Dr. Luther C. Peter, in which he directed attention to the fact that the treatment of the disease must be largely prophylactic, first by preventing the causes which give rise to the convulsion and, second, by preventing the subsequent convulsions, with the consequent mental and physical changes. He believed that much more could be done for the patients by careful attention to the diet, daily bath, sleep and environment, especially in children, than by medical measures, and these measures are particularly important if the child has a neurotic predisposition. He stated that after observing over 2,000 cases of nervous disorders in children in his Clinic at St. Joseph's Hospital, and in private practice, he believed tea and coffee acted in many cases as inducing factors, and in some cases were the only causes of epilepsy in children; the great amount of mental work done by children with the present school system, he believed also was accountable for a considerable number of these cases. After the epileptic habit is formed, he believed the general management of the case to be just as important a factor, and while he believed that drugs played an important rôle in the cure of these cases, he felt that the general management was the most important factor of every complete recovery. The food should be chosen with especial reference to the individual requirements of the patient, and the condition of the digestive organs, and as a rule any easily digestible and assimilated food may be employed, provided its use is not followed by gastro-intestinal disturbance, as deranged stomach or intestinal fermentation is liable to produce a convulsion. If the patient's occupation does not particularly require meat, it is a good plan to restrict the amount taken. The author recommended the closest scrutiny of all parts of the body in order to detect any cause for the epilepsy and stated that he had seen cures follow the correction of refractive errors, removal of adherent foreskin, removal of constipation, etc., the success depending entirely upon the early recognition of the condition and removal of the cause. The toxic form, including the alcoholic type, he believed to be especially amenable to general treatment. It is pretty generally conceded that the convulsion has its origin in the cortical cells, and, therefore, the class of drugs which do the most good are nerve sedatives, the drug most exten-

sively used being the bromide salts. He stated that he believed in many instances the mental dulness was due more to the excess of the bromides than to the epilepsy and referred to the fact few patients could take this remedy in larger amounts than 30 to 40 grains per day without producing bromidism; the addition of several drams of infusion of digitalis often intensifies the sedative action, without aggravating the bromidism; a minim or two of Fowler's solution will prevent the acne. Chloral will act beneficially for a time in controlling the convulsions and if the patient has mental warning of the approach of an attack and it is given in sufficiently large doses it will often prevent the convulsion. He stated that he had used the fluid extract of solanum in a considerable number of cases, and in adults had found that as good results could be secured with from 2 to 4 drams of this drug as from 10 to 15 grains of potassium bromide, and its use can be continued indefinitely without the depressing mental effects. Its use has been followed by equally gratifying results in children, who usually stand the bromides so poorly. In those patients who have a considerable period of premonition, inhalation of nitrite of amyl is of much value.

**"The Diagnosis of Atypical Epilepsy."**—This was the title of a paper read by Dr. A. C. Buckley, in which he called attention to the necessity for early diagnosis and correction before the nervous mechanism had formed the epileptic habit. After giving in detail the symptoms of a typical attack of epilepsy he stated that there were many cases which were not recognized for months or perhaps years, owing to the fact that the attacks may be of such a nature as not to be noticed by the patient or his family, or may occur only during the sleeping hours, when, except for the fact that he feels fatigued and has marked muscular soreness upon awakening, the patient, when he seeks medical advice, is not aware of his true condition. He believed that the minor attacks were less responsive to treatment than the major attacks, although there is no strict line of demarcation between the two. The minor attacks usually consist of momentary unconsciousness which very often is not recognizable, and it is in these minor attacks that the greatest deviation from the set symptoms occur. Nocturnal epilepsy, when the symptoms are not sufficient to be recognized by the patient, can only be diagnosed by the after-signs, such as soreness of the tongue, usually on one side, frequently bloodstains on the pillow, if the tongue has been bitten, minute conjunctival extravasations, voiding of urine in bed, and even these are frequently absent. He believed that a confusing factor in diagnosis was the differentiation between the minor epileptic attacks and syncopeal attacks; the epileptic attacks occur independent of the surroundings and in the absence of any predisposing causes, such as emotion, physical exertion, overheated rooms, hot, humid weather, etc., which frequently produce syncopeal attacks. In the latter condition there is usually an irregular pulse and clammy skin which is not present in epilepsy. In epilepsy the loss of consciousness is sudden and complete and returns quickly, while in syncope it is usually preceded by a subjective feeling of faintness. Epilepsy may be preceded by an aura which may be described as a feeling of faintness, but there is usually associated with it a sensation of fear or strangeness which is not present in syncope. Distinct vertigo is in favor of epilepsy, although care must be taken to distinguish the vertigo from dizziness, which is sometimes present in syncope. He considered the automatic type of epilepsy of great importance. He believed that hysteroid could usually be distinguished from epileptic seizures by the fact that the former are usually coordinated.

**Etiology of Epilepsy.**—Dr. Charles W. Burr referred to the fact that the etiology of epilepsy was still very much in the dark, and believed that the greatest hope lay in the prevention rather than the cure of epilepsy, and in children predisposed to this condition, it is especially important that they should live out of town, have nourishing food and avoid mental overwork. He believed that alcohol played a considerable rôle in the production of epileptic seizures and reported the case of a shoemaker, who would have attacks only after a drunken debauch. He felt that many of the cases of dementia were much accentuated by the long-continued use of bromides, and while he had not attained very good success with horse-nettle, thought this fact could probably be accounted for in that he had not given it in sufficiently large doses. In regard to diet, he did not believe that the patient should be required to forego red meat altogether, although he felt that its use should be restricted. He referred to several cases of postepileptic automatism, one man would go through the motions of pulling a rope for three or four minutes very time he would have an attack, and he expressed the opinion that in some instances this condition was responsible for the perpetration of innocent crime.

**Careful Study of the Aura.**—Dr. Samuel Wolfe, felt that a careful study of the aura in connection with the sensory nerves might reveal something in regard to the etiology of the condition and expressed the opinion that the attack originates in the peripheral sensory nerves rather than in the cortical cells. He referred to the fact that a large number of curious conditions have been recognized as epileptic equivalents, directing particular attention to the fact that an Italian writer had recently advanced the theory that a good many of the cases of tachycardia are really cases of epilepsy, and reported a case of tachycardia which had recently come under his observation, which he rather inclined to think was of this class. In the treatment of epilepsy he believed the bromides to be the foremost remedies, and if bromidism occurs, the addition of one or two drops of Fowler's solution with each dose is of value. Atropine is also frequently of advantage in conjunction with the bromides.

**Pupillary Incoordination and Hypermetropic Astigmatism.**—Dr. Wendell Reber stated that he had made a careful study of the ocular condition of about fifty epileptics for about a year, and found pupillary incoordination in about one to three. Optical imbalance in about 35 per cent. and in a good many hypermetropic astigmatism was present. He did not attach much importance to these eye conditions, however, as all of them frequently exist in other conditions. He referred to the fact that the majority of epileptics were great overfeeders and not very active.

Dr. Lewis H. Good reported a case of a man who became intoxicated and after he went home fell over in a fit; after this was over he was very violent for about an hour, breaking up furniture, etc., after which he fell into a deep sleep or comatose condition. He also reported another case, apparently hysterical, in which the symptom is incessant talking for about half an hour, the acts being both nocturnal and diurnal. The patient was run over by a wagon when a child and at puberty had amenorrhea and dysmenorrhea, since which time she has had these attacks.

Dr. Solomon Newmayer referred to the rarity of the occurrence of epilepsy among the Hebrew race. He reported the case of a man who was suddenly taken ill on a very hot day; he became unconscious had a temperature of 104° F. and spermic fever was suspected and the usual treatment applied. After about an hour he revived, the case proving to be one of epilepsy.

J. Frank Wallis reported three cases of convulsions, one of which he attributed to the patient eating cabbage, the other to eating sausage and pretzels, and the third to the fact that the patient had eaten a very hearty dinner. All of these cases were relieved by rectal injection, and the suggestion was made as to whether they were cases of true epilepsy or not.

**Removal of Obstructions of the Nasopharynx and the Ear.**—Dr. Nathan G. Ward referred to cures that had been reported by the removal of obstructions of the nasopharynx or by the removal of obstructions from the ear, the condition in most of these cases being obstruction or deflection of the septum, adenoids, enlarged tonsils, and a few cases of pharyngeal abscess and suppurated ears. He believed that the greatest good could be secured by the use of prophylactic measures tending to prevent the attacks.

**Cold Water Treatment.**—Dr. Charles C. Biedert reported the cases of two brothers, both of a neurotic temperament, in which the attacks were frequently superinduced by disputes with their wives; in which the cold water treatment was administered with gratifying results. He also referred to a case caused by alcoholism which was benefited by this same method.

Dr. Howard S. Kinne felt that a very important factor in the prophylactic treatment of epilepsy was the placing of all infants on a properly nourishing diet, as nearly similar as possible to the mother's milk; and believed that one reason why epilepsy was less frequent among the Hebrew race was owing to the fact that the mothers usually nurse their children. He did not believe that alcohol played a very important part in the production of epilepsy in the subject itself, but was more manifest in his descendants.

**Convulsive Attacks Produced by Bradycardia.**—Dr. William Egbert Robertson called attention to the fact that convulsive attacks produced by bradycardia are very similar to the epileptic seizures. He believed that too often convulsions in children were attributed to teething and very little attention was paid to them, which he felt accounted for at least some of the cases of epilepsy. He felt that tea and coffee played but a small rôle in the production of epilepsy in those not predisposed to the disease.

Dr. Luther C. Peter, in closing the discussion, stated that he did not believe solanum to be any better drug than bromide, but its greatest merit consisted in the fact that it could be given in sufficiently large doses to benefit the patient for a long time, without producing any mental effects. In regard to alcohol as a causative factor, he stated he had three cases under his observation at the present time who were subject to the seizures only after a debauch, but did not feel prepared to say that this was the cause of the epilepsy.

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## NEW YORK NEUROLOGICAL SOCIETY.

*Stated Meeting held April 7, 1903.*

The President, Pearce Bailey, M.D., in the Chair.

**Birth Palsy—Syringomyelia.**—Dr. Edward D. Fisher presented a man, twenty-five years of age, who had had a birth palsy, apparently the result of a tedious labor and a forceps delivery. There were present the characteristic athetoid movements, but the epileptic attacks had ceased in childhood. When fifteen years old he began to notice a wasting of the muscles of the left hand and forearm along with some disturbances of sensation. Subsequently the right hand became similarly affected. On examination, there was found to be almost complete loss of pain and temperature sense, and the tactile sense was not good. There was no sensation on either side to the strongest faradic current. There was absolute loss to both the faradic and galvanic currents in both hands. In the forearm there was a diminished reaction. The condition just described had progressed slowly during the past ten years. The reflexes were greatly exaggerated on both sides. The case had been previously diagnosticated as progressive muscular atrophy, but he would make a diagnosis of syringomyelia, quite probably originating in a slight spinal hemorrhage. The patient was very intelligent and in perfect health. He had presented no bulbar symptoms.

Dr. B. Sachs thought the association of syringomyelia with an infantile cerebral palsy was unique. The suggestion of a hemorrhage occurring simultaneously into the cervical portion of the cord at the time of the cerebral palsy appeared to him a good one. Recently cases of congenital spastic paraplegia had been reported which were known to have been produced by hemorrhage into the cord lower down. The speaker said that a few days ago he had seen a case of apoplexy in an elderly person resulting in a left-sided hemiplegia. After a few days very slight motion returned in the left hand, and he was astonished to find that he could secure fairly good motion of the paralyzed hand when asked to close the other hand. This observation was a common one in children, but he had not before noticed it in adults.

Dr. Pearce Bailey said that a few years ago Schultze described hemorrhages into the spinal cord occurring in young infants in connection with difficult labor, and the subject had assumed a medicolegal interest. In the cases of hematomyelia that he had seen he had never been able to observe them long enough to see the progression of the symptoms.

**Suture of Popliteal Nerve: Perfect Restoration of Function.**—Dr. Russell A. Hibbs presented a boy, fifteen years old, who had come to the Orthopedic Hospital on October 6, 1902, with a history of having fallen upon a knife several weeks previously and injured the leg. On October 9 he was operated upon, and on exposing the site of the injury it was found that the popliteal nerve had been divided. It was accordingly sutured with a practically perfect result. While the voluntary power in the muscles supplied by this nerve was lost there was still some sensation, which was apparently accounted for by the fact that a few fibers of the nerve remained intact. The limb was kept slightly flexed for six weeks after the operation.

Dr. M. Allen Starr thought surgeons as a rule did not recognize the great importance of suturing nerves at the time of such injuries, for, it was not uncommon for persons so afflicted to seek relief a considerable time after the injury. There could be no question that a divided nerve would not unite spontaneously in the majority of cases, and it was equally certain that by nerve suture a good result was usually secured. He had seen one or two interesting cases in which nerve suture had been essayed in children in whom the brachial plexus had been injured at birth. Four successful cases of this kind had been recently reported. The operation consisted in laying bare the brachial plexus, finding what nerves were torn and uniting them.

Dr. William M. Leszynsky said that in injuries of the hand special care should be taken to determine whether or not the nerves had been injured. He had recently seen a case in which the divided tendons had been sutured and the divided ulnar nerve had been entirely overlooked. As a result, a neuritis of this nerve had developed before he saw the case. Although rather late an operation had been advised in the belief that even late operations were often successful.

Dr. Fisher said that he had had under observation for some time a facial paralysis that dated from childhood,

the patient being a woman of thirty. After awhile a faradic response from the facial muscles was obtained; hence, he thought one could hardly place a time limit after which nerve suture would afford but little prospect of benefit.

Dr. Hibbs said that in his case the original wound had been sutured at a hospital, but the nerve injury had not been noticed.

**Paralysis Agitans (?)**—Dr. J. Ramsay Hunt presented a man of forty-three years, a cigar roller by occupation. The present affection dated back four years. It had first been noticed that the right hand was weak and tremulous, but he had continued at work for three years. Last July the head also became tremulous and the right leg felt heavy. When first seen, about one month ago, examination showed tremor of the right hand without rigidity; a slight atrophy of the right forearm; a tendency to monotony of speech and a rather expressionless face. The question arose as to whether this was an occupation atrophy or, as he was inclined to believe, a case of paralysis agitans.

Dr. Hunt also reported a case at the Montefiore Hospital which had presented the characteristic picture of paralysis agitans for several years before death. An autopsy of the brain was alone permitted. The vessels showed marked arteriosclerosis. There was an excessive degree of pigmentation and some rounding of the processes of the cells in the cortex and in the portion of the cervical cord removed for examination—in short, those changes that had been regarded as occurring frequently in paralysis agitans. The specimens were exhibited under the microscope.

**Elephantiasis Ossium.**—Dr. I. Abrahamson presented a woman, aged thirty-six years, showing a peculiar glossy appearance of the skin of the forehead and a remarkably wide supra-orbital ridge. Examination revealed a ptosis of the right eye, a double divergent squint and a marked contraction of both inner fields of vision. According to her husband, the changes in her outward appearance had been progressive. The malar bones were enlarged, and apparently the hands and feet were growing larger. The condition was possibly due to luetic disease of the apophysis because there was specific disease of the eyes.

Dr. Starr remarked that the appearance of the eyebrows pointed strongly to the case not being one of acromegaly or myxedema, but of elephantiasis ossium. The case appeared to be in an early stage.

Dr. Leszynsky said that acromegaly could be excluded by the condition of the visual field, as in that disease there was usually a bitemporal hemianopsia.

**Paralysis Agitans—Discussion.**—Dr. B. Sachs said that he was of the opinion that this was distinctly a disease of the senile period. In this period the two most important factors were emotional excitement and some prolonged and exhausting disease. The point of differential diagnosis to which Charcot had attached so much importance, the non-involvement of the head in paralysis agitans and its involvement in multiple sclerosis, seemed to him a point not well taken, for he was sure he had seen involvement of the head in fully 75 per cent. of cases of paralysis agitans. Charcot's attempt to differentiate sharply between these two affections seemed to him to have been carried beyond a justifiable limit. He had seen cases giving the symptoms of multiple sclerosis, and yet later on develop a distinct picture of paralysis agitans. There was a young man at the Montefiore Hospital whom he had first seen when only about eighteen years old, and who developed the typical carriage, tremor and speech of paralysis agitans. As the years went on he developed nystagmus and a marked exaggeration of all of the reflexes, and his speech was now as much that of multiple sclerosis as of paralysis agitans. He also recalled the case of a young woman first seen by Professor Mendel in Berlin, who made the diagnosis of hysterical tremor. When seen by the speaker, a few months later, she presented what appeared to be the first symptoms of multiple sclerosis. At the present time, she presented the typical picture of paralysis agitans. This experience led him to think that there must be some relationship between these two diseases, and the case presented this evening by Dr. Hunt gave color to this view. With regard to the treatment of paralysis agitans he was accustomed to make use of hyoscin and the ordinary sedatives, and probably all present believed that no drug did much good. The only treatment that was fairly satisfactory was the use of some form of vibratory therapeutics.

Dr. Stuart Hart said with regard to the records of Dr. Starr's clinic at the Vanderbilt Clinic, that out of 219 cases of paralysis agitans there recorded 139 were males and 80 females. Under thirty years of age there developed 2 cases, both males. The disease commenced in 88 cases between fifty and sixty years of age. Among heavy workers there were 45 males; among those particularly exposed to cold there were 24 cases; among the lighter trades there were 24 cases; among those working in factories were 14 cases. In 6 cases it was stated that the mother had paralysis agitans, and in three the father was said to be so affected, while in several other cases brothers or sisters were said to be similarly affected. Forty patients believed that the disease arose from anxiety or worry, and half of these directly attributed it to fright. In quite a number of instances the history stated that the tremor had developed very shortly after some trauma of the part first exhibiting the tremor.

Dr. Joseph Collins presented an analysis of 50 cases of paralysis agitans. Of this number, 34, or 68 per cent., were males, and 16, or 32 per cent., females. The average age at which the disease developed was 51½ years, the youngest being thirty-two and the oldest seventy-two years old. They were divided according to occupation as follows: Merchants, 7; workmen, 8; laborers, 5; tailors, 4; clerks, 1; clergymen, 1; drivers, 1; carpenters, 1; plasterers, 1; engineers, 2; gardeners, 1; houseworkers, 9; captains, 1; no occupation, 7. The nationalities were: United States, 8; England, 1; Ireland, 16; Germany, 7; Holland, 1; Russia, 6; Austria, 1; not given, 10. The attributed cause was: Worry, in 7 cases; alcohol, 1; excesses, 1; excitement, 1; shock, 1; refrigeration, 1; hard work, 1; pneumonia, 1; grief, 1; bite of cat, 1; unknown, 34. In 7 cases there was a history of injury; in 1 of operation; in 1 of hard work; in 1 of syphilis; while in 40 cases there was no special history of this kind. There was a history of neuropathic heredity in 13 of the cases, of 26 per cent., and a history of paralysis agitans in the parents or uncle in 6 instances. The average duration when first seen was four years, the longest being twenty years and the shortest five months. The part to first show trembling was left upper extremity in 11 cases, left lower extremity in 8, right upper extremity in 15, right lower extremity in 1, upper in 7, lower in 2, right upper and lower in 1, left upper and lower in 1, and all extremities in 4 cases. The initial symptom was: trembling in 24 cases; pain in 11, unsteadiness in 3, numbness in 2, nervousness in 1, stiffness in 1, inactivity of fingers in 1, weakness in 1, loss of power of right hand in 1, headache in 1, and not given in 4 cases. The relation of curvature of the spine was investigated specifically in only the last 20 cases, and was noted in 7 cases. He was convinced that paralysis agitans was a disease of early senility occurring as the reward of virtue.

Dr. M. Allen Starr said that he had had a fairly large experience with paralysis agitans, yet it did not bear out

Dr. Collins' statement about the frequency of the disease among the Celts and its comparative rarity among the Hebrews. He could recall quite a large number of patients among the Jews and a number among the Germans. In hospital and clinic work one was apt to get a one-sided view of such matters because of the large proportion of persons of certain nationalities at such places. Nor did his observations bear out what the last speaker had said about heredity; probably four or five per cent. would represent the proportion showing hereditary influence. Anxiety and trauma appeared to him to bear a distinct relationship. He had never seen a patient absolutely cured of paralysis agitans, but he had observed a very marked improvement in one, and a great variability of symptoms in a number of other cases. The disease did not appear to be a steadily progressive one. He had found that the Swedish massage, skilfully administered, after a prolonged hot bath, gave these patients so much relief that they were willing to keep up such treatment for years. The great majority of his patients had found benefit from hyoscine in doses of 1/100 of a grain, given from two to five times a day.

Dr. Leszynsky said that dispensary and hospital patients were not benefited, but with private patients it was quite different. Four times within the past ten years he had had the opportunity of making the diagnosis very early in the disease. The disease certainly presented remissions at times, and traumatism certainly exerted a distinct influence. Most of these patients were very amenable to suggestion, and in this way could be benefited by treatment. He had not observed good effects from hyoscine except for a very short time, because most of the patients complained of the action of this drug. As systematic exercise had been recommended he had tried the Swoboda system of exercises, which call for voluntary effort entirely, and the patients appeared to be benefited thereby.

Dr. Joseph Fraenkel said that in the past ten years he had seen many cases of paralysis agitans and had witnessed 10 autopsies. It was rare to find a person suffering from paralysis agitans who was gray-haired or old-looking, and the autopsies showed a remarkable freedom from arteriosclerosis. These persons were rarely addicted to the use of alcohol or exhibited evidence of syphilitic infection, and to this extent he would indorse Dr. Collins's statement that this disease was "the reward of virtue." He saw nothing to support the theory that this was a disease of senility. It was common to observe a marked hypertrophy of the skin in these patients. A characteristic feature was the difficulty of stopping the patient when on any one line of thought and change him to another. A pseudonystagmus was often observed. Although the tremor ceased at night, the paralysis agitans patient presented the same attitude in sleep as when awake. He agreed with Dr. Collins that very little could be done for these patients by treatment of any kind.

Dr. Harlow Brooks said that he had only studied four cases of paralysis agitans post mortem, and the findings were so conflicting that he was very skeptical about any lesions claimed to be characteristic of the disease. He was of the opinion that deformity of the spinal column was very common in persons who were not very well developed, basing this opinion upon many observations made in the deadhouse as well as in examining during 1898 the recruits for service in the regular army. He thought that fully 7 out of 50 such recruits would show as much spinal deformity as Dr. Collins's cases, even though these persons were of sufficiently good physique to be accepted in the army.

Dr. Collins said that his statistics with regard to the Celts might be refuted, but to do so the actual figures must be presented and not cases recalled from memory. He believed also that the more paralysis agitans was treated the worse it became.

Dr. Hunt said he understood that the premature senility referred to the nervous system, and not to the arterial tree when used in connection with paralysis agitans.

Dr. Pearce Bailey was of the opinion that two-thirds of the cases of paralysis agitans began after the age of sixty. A disease which could become fairly well developed in the course of a few weeks could hardly be regarded as an organic disease of the nervous system, and he was inclined to think that the evidence was rather in favor of its being a disease of the muscular system, resulting possibly from the action of certain toxins. He believed it was distinctly induced by trauma, either psychic or physical, for there were too many definite and striking clinical records of this kind. The disease usually first appeared in the hands, and yet in cases of injury to the legs the disease was more apt to begin in the legs. A large proportion of the persons coming to Dr. Starr's clinic suffering from paralysis agitans were apparently right-handed workers.

**Specimen of Brain Abscess.**—Dr. Joseph Collins presented this specimen removed from an Italian laborer, forty years old, who had not been sick up to two months before his admission to the City Hospital, since which time he had suffered from headache only. On January 14 he became stuporous. There was no paralysis, paresis or spasm, in fact, no objective symptom other than stupor. Examination on February 3 showed the head to be drawn over to the right side and flexed, and the right upper extremity partly flexed at both joints. There was a peculiar elastic resistance of the right upper extremity on extending it. Knee-jerks were absent. The plantar jerk on the right side was lively, but could not be elicited on the left side. The body temperature remained about normal, and the pulse varied from 68 to 90 and the respirations between 20 and 22. Dr. Collins's diagnosis was circumscribed non-purulent encephalitis, and because of the motor symptoms on the right side it was thought to be in the left cerebral hemisphere. However, the lesion was found to be a focus of comparatively recent yellow softening situated on the right convexity, involving that portion of the first temporal convolution lying immediately below the supramarginal and angular gyri and separated from these by the Sylvian fissure. It involved the posterior arm of the internal capsule, and extended apparently into the extraventricular radiations emanating from the lower third of the posterior central gyrus. The internal capsule was not involved in its passage between the basal ganglia. No thrombus could be found. The special interest of the case lay in the fact that the motor symptoms were on the right side and the lesion was found on the same side.

## OBSTETRICAL SOCIETY OF PHILADELPHIA.

*Stated Meeting, April 2, 1903.*

The President, J. M. Fisher, M.D., in the Chair.

**Treatment of the Common Clinical Forms of Gonorrhea in the Female.**—This paper was read by Dr. R. Oliver Kevin, who deplored the fact that too little attention was given by physicians generally to the study of gonorrhea in the female and as a consequence the disease is comparatively seldom recognized until the woman has communicated the disease to others. The baneful effects of gonorrhea in the female were mentioned and asserted to be more serious than syphilis; as evidence of this were cited many cases of pus tubes, peritonitis, cystitis, abscesses, endometritis, etc., which occasioned much suffering and chronic invalidism. The point especially emphasized was the important rôle

played by the infection of Bartholin's glands in propagating the disease to the male and leading to apparently fresh infections in the woman herself; the cause of this is the extreme frequency of involvement of these glands which break down, forming small sinuses full of gonococci which will escape the observation of physicians unless pains are taken to critically examine the Bartholin glands in every woman presenting herself with symptoms of irritation or inflammation of the parts. The following is a classification as to structures involved: Urethra, cervix vagina, vulva, uterus, rectum and inguinal glands. If the uterus is the seat of an acute gonococcus infection local measures should be avoided owing to the danger of favoring the communication of the disease to the tubes, ovaries and peritoneum. In such cases the patient should be placed in bed and treated on general constitutional principles until the acute stage has subsided, after which injection of one-half ounce of 10 to 20-per-cent. solution of argyrol should be carefully made once daily. In involvement of the urethra, a 5 to 10-per-cent. solution of argyrol should be made 3 or 4 times daily, either by the physician or the patient. The writer stated that since adopting this plan of treatment no involvement of the bladder has been observed in his cases. Should, however, infection of the bladder exist, urinary antiseptics should be administered internally and the bladder be irrigated with weak solutions of silver nitrate, copper sulphate or potassium permanganate, after which one-half ounce of a 20-per-cent. solution of argyrol is injected in the bladder and allowed to remain. When the urethral follicles or Skene's glands are involved, the urethra should be dilated with ordinary sounds lubricated with Fenger's ointment, or, preferably, 20-per-cent. argyrol ointment in lanoline. In some cases the glands are best treated by injection (blunt-pointed hypodermic) with carbolic acid or silver nitrate 20 grains to the ounce.

In gonorrhea of the cervix the parts must be first cleansed of adherent secretions and a few drops of 20-per-cent. argyrol solution or 5-per-cent, protargol injection with a long-nozzled syringe, care being taken to previously expel all air from the syringe to avoid production of uterine colic. Treatment must be made daily. Tampons saturated with 20-per-cent. argyrol solution should be left in contact with the cervix for from 4 to 6 hours in order to obtain the continued gonococcidal effects of the drug.

When the uterus is involved, the organ should be irrigated with any of the following solutions: Creolin, lysol, normal salt solution, potassium permanganate, argyrol, protargol; or a mixture of carbolic acid, sulphocarbolate of zinc and glycerine. After irrigation a strip of gauze saturated with 20-per-cent. argyrol solution should be packed in the uterine cavity and allowed to remain. In some cases after subsidence of the acute stage the cervix and entire vaginal mucous membrane should be painted with silver nitrate solution 10 grains to the ounce. For the catarrhal process that remains no combination equals in efficiency a mixture of ichthyol 25 per cent., argyrol 25 per cent. and glycerin 50 per cent., used freely as a local application every day or two. Uterine curettement is dangerous when gonorrhea exists.

The author summarized his paper as follows: Always make a thorough examination of the region of Bartholin's glands in suspected cases. If these are infected, flush the vagina with antiseptic solutions, make free incision in the sinuses and glands, remove diseased or necrosed tissue with a curette, and swab the entire surface with 50-per-cent. argyrol solution, strong carbolic acid, or nitrate of silver. Argyrol is to be preferred because it is non-irritating and possesses deep penetrative power. Never use local treatment in an acute gonorrhea of the uterus, but put the patient at absolute rest and endeavor thereby to prevent the spread of the disease to the uterine adnexa and peritoneum.

Dr. Maier said he had enjoyed Dr. Kevin's paper very much; although his intra-uterine method of treatment at times startled him. It is in this class of cases that one must proceed with exceeding care or be liable to bring about an exacerbation of the disease. He thinks the tendency of the gonococcic infection is to remain more superficial, the micro-organisms lying in and between the epithelial cells. For this reason the object of their treatment should be to bring about a thorough desquamation of the superficial tissues. Ichthyol lends itself very favorably to this. Lately he had been using a 50-per-cent. formalin solution with marked benefit.

Dr. Oliver Hopkinson said he would like to ask Dr. Kevin what salts of silver he uses, and which he prefers under certain conditions. He has not found much difference in the use of protargol from that of the old nitrate of silver. He would like to know whether Dr. Kevin has found these new salts superior as applications to the old silver salts.

Dr. W. S. Stewart remarked that he had a little experience with gonorrhoea in various forms, particularly in males. His largest experience was during his service in the Civil War. He found his results were very much better when he began with mild treatment. The inflammation resulting from strong caustics was more terrible than the original disease.

Dr. John C. DaCosta said that the younger Gross, who was most successful in treating these cases, used continually to urge common sense in treating them; and himself used a great deal of common sense in his methods. In the primary inflammatory stage he used the mildest possible remedies. Dr. DaCosta has not much confidence in the new salts, believing them to be the preparations of manufacturers who are interested in pushing them. Some possibly use them on the principle of the old doctor's advice to his son: "My son, use new remedies while they are fashionable and while they cure." In the chronic cases he uses the old-fashioned nitrate of silver in solution of not less than 60 grains to the ounce, following the application sometimes by salt solution and finds that one, or sometimes two, applications often cure an old chronic gonorrhea.

Dr. Kevin in closing, said that swabbing out the uterus will not cure if the gonorrhea is not located there. Gonorrhea vaginitis is very rare. He has seen it but a few times in his life. He has had no experience in the use of formalin. Menge reports success with it in chronic cases. Dr. Kevin was afraid to use it in office practice, and if employed in the uterus he would advise that the cervix be first dilated to give good drainage. In chronic cases he has found the use of argyrol and protargol satisfactory, also nitrate of silver, although it is not as penetrating as the silver salts protargol and argyrol. He has had good results from them all used in the cervix. His experience has been that if he was not able to get rid of the purulent tenacious drop at the cervical mouth to go into the uterus with the old-fashioned treatment of tincture of iodine and carbolic acid, when the character of the discharge would soon change for the better and lose its mucopurulent appearance.

**The Electrothermic Angiotribe in the Removal of a Large Suppurative Tubo-ovarian Mass with Resection of Four Inches of Colon and End-to-End Anastomosis.**—This was the subject of Dr. A. J. Downes, of Philadelphia, in which he reported a case of suppurative tubo-ovarian disease forming a mass that completely filled the left side of the pelvis with dense adhesions to surrounding structures including a portion of the descending colon, which after being freed from its surroundings presented a thick, wide pedicle, closely as-

sociated with the uterus. In order to remove this with the least possible danger of contaminating the field of operation by escaping pus the electrothermic angiotribe was applied close to the side of the uterus for forty seconds. Upon removing the mass by section on the outer side of the thermic blade and releasing the instrument it was observed that the stump left by the operation was a well-cooked, and, therefore, sterile, non-oozing ribbon of tissue closely hugging the uterus. The colon stripped of its mesentery and partially denuded of peritoneum to the length of four inches was resected as follows: The bowel was clamped by his three-eighth-inch angiotribe at either extremity of the denuded area and the current turned into the blades for fifty seconds. After removing the blades section was made through the middle line of the ribbons thus formed. With the ends of the bowel thus occluded anastomosis was performed by a triple layer of continuous chromicized catgut sutures without sight of, or contact with, the mucous membrane. With the little finger the bowel was now invaginated at some distance from either side of the site of the operation with a view of breaking through the ribbons and thus re-establishing the caliber of the canal. Gas escaping from one section into the other proved the success of this manipulation. Five actively bleeding points, deep in the pelvis, were controlled by grasping them with the tips of straight forceps heated with his so-called electrotherm. Two heavy bands of torn omentum were hemostased by a one-fourth-inch blade thermic angiotribe in twenty seconds. The abdomen was closed without drainage. On the fifth day the patient had three natural bowel movements. Her recovery thus far has been uninterrupted.

Dr. J. M. Fisher said, in the discussion, that upon Dr. Downes' departure for Europe the patient was left in his charge and it is now twelve days since the operation. There has been an aseptic convalescence from the beginning, and the bowels are moved daily. As indicated in the paper, he assisted Dr. Downes in the operation. The patient presented complications that proved of especial value in the demonstration of the practical utility of his apparatus. The mass removed was closely associated with the uterus, enveloped by densely adherent omentum and the lower portion of the colon, it was firmly bound to the rectum and floor of the pelvis and was enucleated with considerable difficulty. Had the ordinary method of hemostasis been employed the close proximity of the mass to the uterus would have required ligation of the wide pedicle in sections and an incision of the parts through pus-degenerated areas. With this instrument, however, the whole width of the pedicle was grasped, the electric current was applied to the blades for forty seconds, and the whole mass was removed within less than a minute, leaving a well-cooked, sterile, and non-oozing stump that was closely hugging the uterus without a drop of escaping pus to contaminate the field of operation. To him the resection of the colon was a revelation. The intestine partially denuded of peritoneum and stripped of its mesentery to the length of at least four inches, certainly was sufficient to demand resection of this portion of the gut. In doing this he grasped the ends of the section to be removed with the angiotribe and by pressure and the electrothermic method hermetically sealed the lumen of the gut. Cutting through the middle line of the dessicated ribbons thus formed after releasing the instrument, not alone left the ends to be reunited, sealed and sterile, but the closed cooked ends of the portion of gut removed likewise rendered this a negative factor as a possible source of infection. The cooked ribbons of the bowel within the abdomen were now placed one upon the other and the anastomosis effected as described. He now invaginated the intestine from either side of the line of suture and broke through the agglutinated structures and thus re-established the continuity of the canal. At no stage of the operation was it possible for either fecal matter or gas to escape, in fact no portion of the intestinal mucosa was exposed to view. Taken all in all, Dr. Fisher says it was the neatest, and aseptically considered, the cleanest and most perfect piece of bowel surgery he had ever witnessed. He cannot conceive how one could do an intestinal resection with greater safety than by this particular method. Anastomosis was made in much less time and just as effectively as if it had been done by any one of the commonly recognized procedures, minus the possibility of infection from exposure of the lumen of the gut. Recently he read a report of Dr. Keefe, surgeon to one of the hospitals in Providence, R. I., who has done a number of resections with the Downes instrument upon dogs, and in no instance did he consider it necessary to separate the agglutinated ends before closing the abdomen, the continuity of the canal in every case becoming re-established within a few days by sloughing of the inverted ends. The pathological report upon the specimen removed by Dr. Downes has not yet been received. Dr. Fisher believes it to be a suppurating ovarian fibroma.

Dr. Kevin said that he saw Dr. Downes operate on a varicocele by his method with the angiotribe; there followed no complication or stitch abscess and the case recovered more rapidly than is usual in the ordinary open operation. Personally he thinks he would feel more secure in an abdominal operation on himself, to have a good stout ligature on a bleeding abdominal vessel. He also saw Dr. Downes remove the sac of a hydrocele and there was no sloughing or secondary infection, while the recovery was more rapid than usual.

Dr. Nassau said he had seen Dr. Downes use the forceps but once. That was before he developed the angiotribe. Personally he knows nothing of the use of the instrument. It seemed to him that the sealing over temporarily of the ends of the bowel is a very questionable method. In doing end-to-end suture of the intestine it is an important question whether it is not better to put the sutures through the entire coat of the bowel, as suggested by Connell, and tie the last stitch inside, and whether it does not make a better and safer union. He has used that method in one gastro-enterostotomy and been perfectly satisfied regarding the line of union between the intestine and the stomach. The patient, however, died from hemorrhage. If this method of Dr. Downes were used to make end-to-end suture it would be impossible to tie our sutures in the bowel. The Lembert suture does not hold a very great amount of tissue, and unless one is certain to pick up the submucous coat in the suture, one might as well not sew it at all. He believes some of the gentlemen who have studied the question of intestinal anastomosis would think it safer and better to sew the mucous membrane separately, making a row of approximal sutures and over all a line of sealing sutures. If the peritoneum is going to take care of the pus from pus tubes he thinks there is no need to fear a slight amount of infection from the bowel contents during anastomosis. This danger of infection can be eliminated by packing off. He would only be afraid to trust the peritoneum in the appendix cases, though Dr. Morris, of New York, has claimed such nice results. He has seen other gentlemen operate in the same way with great success. In one patient who left the hospital last week a considerable amount of pus was spilled, but the wound was disinfected and closed without drainage. There was little pain, no fever and no suppuration. In a second case the appendix was so plastered over with lymph that dissection was difficult. When it was stripped loose and the adhesions broken up the wound was disinfected, the abdomen closed and

the progress was satisfactory. If in such cases one can take care of infection, why should a method be used that might possibly give insecure stitching and in which there is difficulty in applying the mesenteric portion of the stitch.

Dr. Franklin said that he had seen Dr. Downes operate eight or nine times and had seen the cases afterward and known that the cures were perfect. He seemed to get better results in the inflammatory and pus cases by the use of his forceps than by the ordinary ligature operation. Whether this is due to the fact that he can remove more infected tissue, or that he leaves less raw surface after operation, Dr. Franklin does not know. He has no trouble in controlling hemorrhage. His present method with the angiotribe is much to be preferred to the one used several months ago.

Dr. Maier desired, through Dr. Fisher, to extend his congratulations to Dr. Downes. He had only seen the electrothermic cautery used once. He decided at that time that it was the ideal method of dealing with a pedunculated mass. He wondered how he would proceed in just such a condition as presented by the paper this evening. From the paper and Dr. Fisher's description he thinks he has overcome the difficulty of sessile attachment. There is remaining one other class of cases which he would like to see Dr. Downes deal with; it is those inflammatory conditions in which the structures are so friable that it is only after the most arduous and painstaking care that one is able to control the hemorrhage. If Dr. Downes is able to dessicate this tissue, and thus rapidly stop the bleeding, Dr. Maier will confess it to be, in his judgment, the ideal method. Concerning the bowel surgery, it takes time, and some handling of the ends of the intestines to introduce Lembert sutures; and he confesses he would feel safer with the forceps. There is some difference in a pedicle sealed and dropped back into the pelvic cavity, and the end of a gut temporarily sealed and subject to the subsequent handling required to introduce sutures.

Dr. Fisher, in closing the discussion of Dr. Downes' paper, said he was convinced that the electrothermic angiotribe is one of the coming things in surgery. Dr. Downes has a well-perfected instrument, and does good work. The mass in this particular case could not have been removed with the ligature without the extravasation of pus, but with the use of this instrument it was removed without the escape of anything to contaminate the field. Time is an element in abdominal surgery. The thick, wide pedicle to which he applied the whole length of the blades was thoroughly cooked within forty seconds and the mass removed; and the stump that was left was necessarily aseptic, and from the homogeneous appearance of the compressed structure he felt confident that there was no danger of hemorrhage. As indicated by Dr. Nassau, he has improved his instrument very materially in the last few months, and has combined the principle of the angiotribe with that of the cooking process first introduced by Dr. Skene. Dr. Skene's instrument was cumbersome; it could not be boiled; the blades could not be kept cool while in use; and three to four minutes were required to cook the structures. As already indicated, Dr. Keefe has done a number of operations with the Downes apparatus with uniform success and those upon the intestines of dogs are worthy of especial consideration by surgeons, and should prove of some interest to the friends of antivivisection. Even though the peritoneum, as has been suggested, will at times tolerate and dispose of small quantities of pus and fecal matter it is a danger to be avoided nevertheless; the object of all in abdominal work is to attain as near as possible the ideal, aseptically. If an intestinal anastomosis can be done without difficulty and without exposing the lining membrane of the bowel, and within one-quarter of the time usually expended in such work, he thinks it a common-sense proposition for us to adopt the plan that offers these advantages. It is interesting to note that those who have gained sufficient familiarity with the use of the instrument consider it indispensable in their work. The objection has been urged that owing to the absence of the electric current in private houses the use of the instrument is necessarily limited; in answering this we might say that abdominal operations at this advanced day are usually performed in hospitals, and of these but few, even in the smaller towns, are unprovided with an electric outfit to secure the necessary current.

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## PHILADELPHIA ACADEMY OF SURGERY.

*Stated Meeting, held May 11, 1903.*

The President, Richard H. Harte, M.D., in the Chair.

**Operations Upon the Stomach and First Portion of the Duodenum.**—This paper was read by Dr. William J. Mayo, of Rochester, Minn., in which he reviewed 303 operations, 286 of which were taken from the records of St. Mary's Hospital, Rochester, Minn., and 17 from the Minnesota State Hospital for the Insane at Rochester and St. Peter. The average age of the patients was forty-two years, 42 per cent. being males and 58 per cent. females. There were 26 cases of duodenal ulcer with two deaths. Lesions in the first portion of the duodenum cannot be easily differentiated from lesions in the stomach, which are due to the same causes. He divided lesions in the first portion of the duodenum into two groups, first, those caused by ulcer; and, second, those associated with gall-bladder disease. Of the ulcers limited to the duodenum, there was 1 acute perforating, 2 chronic perforating, 5 active and 3 cicatricial contractions with obstructive symptoms. Two deaths occurred, one from pneumonia and the other from exhaustion following gastro-enterostomy. Several of the cases could not be distinguished from gall-stones until the operation, which was begun for that purpose, and which condition was frequently associated with it. In three cases the gall-bladder was completely separated functionally from the bile tract; in four cases there were crippling adhesions to the gall-bladder, but without stone or cholecystitis, requiring dissection to loosen. The differentiating features in these cases were good appetite, delayed pain, general absence of vomiting, and only in one case, and in that on only one occasion was there hematemesis. The author expressed the opinion that surgical disease of the duodenum was much more frequent than has been supposed.

**Diseases of the Stomach.**—He divided these into two classes: (1) Gastric ulcer and associated causes of serious disturbance; (2) Cancer of the stomach. Out of the 303 cases reported in this paper 277 involved the stomach, with 28 deaths, or 10.1 per cent., 168 of these cases were in the benign group, with 11 deaths. These cases included all the non-malignant obstructions or conditions calling for operation for gastric pain, with or without acute exacerbation. In the majority of the cases the perverted stomach secretions seemed to be the most important cause, which is shown by the almost constant association of excessive secretions with gastric ulcer. Also in that part of the duodenum not protected by alkaline juices the same ulcers have also occurred after jejunostomy has been performed for the purpose of drainage. Drainage to relieve the excessive amount of secretion and thus produce healing of the ulcer is of great importance.

The following classification of gastric ulcer was made: (1) Round ulcer, (*a*) acute; (*b*) chronic. They

have the definite feature that there is but little thickening about the base of the ulcer; (2) Mucous erosions, a condition which must be accepted with caution; (3) Chronic ulcer with thickened base and usually irregular in form; (4) Benign obstruction without regard to cause, although usually of benign origin.

The last two classes are the ones which most frequently call for operation, chronic ulcer being usually found in adults and is more frequent in females. Spasm of the pylorus was thought to be one of the most important causes of the retention of excessive gastric secretion. There were 109 cases of cancer of the stomach, with 17 deaths, or 15.6 per cent. Late diagnosis and cachexia makes the report of this group rather discouraging, most of the operations were of a palliative character. Early exploratory incision in suspected cases was recommended, and all the vascular and lymphatic connections with the diseased area should be removed. He then gave a full description of the method he employed in doing the operation. The period without recurrence after the operation has been varied, one case having gone two years and another three years and six months. He then discussed the three methods of improving stomach drainage, *i.e.*, pyloroplasty; gastro-enterostomy and gastroduodenostomy.

**Difficulty of Diagnosis.**—Dr. Albert Vander Veer, of Albany, N. Y., referred to the difficulty of diagnosing conditions in the lower third of the stomach and the upper third of the duodenum, referring to two cases in which he thought he had to deal with gastric ulcer, in which operation proved it to be duodenal ulcer. In cases where all the symptoms seemed to point very strongly to an ulcer in the stomach and none was revealed upon opening the organ, he believed it could sometimes be discovered by lifting out the organ and holding it up to the light. The difficulty of differentiating between carcinoma and ulcer, when the growth occured in the posterior wall of the stomach was commented upon; gastro-enterostomy was thought to be the preferable operation for such conditions. He felt that many of the cases were left too long solely under the treatment of the medical man, and that if the clinical history and examination of the patient do not reveal clearly the conditions present, recommended exploratory operation. If possible, the complete operation should be done, but if the condition of the patient is such as to contra-indicate this, much relief can be obtained by a gastro-enterostomy. In regard to shortening of the ligaments for their treatment of gastroptosis, while he had had very little experience with this method, he felt that better results would be obtained by gastro-enterostomy with the establishment of good drainage. In regard to the pyloroplastic operation, he stated that he had in some instances gotten very good results and in other instances the symptoms recurred, which he thought was probably due to the fact that the operation was too high up, and attributed Dr. Finney's success with this method to the fact that he made the outlet lower down.

**Gastro-enterostomy Instead of Pyloroplasty.**—Dr. B. G. A. Moynihan, of Leeds, England, felt that the operation of pyloroplasty could be practically abandoned, he having done the operation three times, and in only one of the three cases did it prove satisfactory, in the third case a gastro-enterostomy being performed three or four months after the original operation. He did not feel that the operation was in any particular as satisfactory as the operation of gastro-enterostomy, stating that he had operated upon 75 cases by the latter method with only one death. He stated that he had not used the Murphy button in the last 65 cases, as he believed the simple suture was preferable, but stated that in the employment of the Murphy button in the first of his cases, he had noticed that it destroyed a considerable portion of the mucous membrane around the union which he considered of very great importance, and which he had been doing in all his operations. By the method which he has employed the section of the stomach and the section of the jejunum where the anastomosis is to be made are each grasped in a pair of forceps and brought outside of the abdomen, and the continuous suture applied. In regard to malignant disease of the stomach he believed that the infection took place principally through the lymphatic system, and in the operation therefor, he believed that first the greater curvature and then the lesser curvature should be removed. In regard to duodenal ulcer he believed that there were but very few cases in which this was a primary condition, feeling that in the majority of cases there had been a precedent gastric ulcer. Gastric ulcer is so frequently multiple that he did not believe excision thereof to be practicable, as future trouble may result from a remaining undiscovered ulcer, and searching for the ulcer materially affects the operation of gastro-enterostomy.

**Early Operation Imperative.**—Dr. J. B. Murphy, of Chicago, referred to the fact that the great majority of all cases of carcinoma occur in the pyloric end of the stomach, and as the first set of glands becomes involved by gravity are the lymphatic glands, any operation which is expected to produce permanent results must look to the removal of these glands, early operation being imperative. He further referred to the fact that about 10 per cent. of all cases of gastric carcinoma occurred in the cardiac end of the stomach and are practically unamenable to treatment. He referred to the fact that the surgeon usually sees the cases of gastric disease in the following numerical order: (1) Gastric carcinoma, (2) gastric ulcer, (3) pyloric stenosis, and (4) pyloric retention. As the gastric carcinoma is usually a sequence of the other conditions, he felt that in order to obtain the best results by operative treatment, the order in which these cases were seen should be the reverse. He believed that in order for the operation of pylorectomy, to attain the best possible results, it was necessary that it should be done early. He referred to the fact that the cases of gastroptosis are treated erroneously by the medical man by washing out the stomach and reducing the amount of food, on the theory that the condition is due to a weakening of the wall of the stomach, whereas, as has been definitely demonstrated by Dr. Mayo, it is due to a mechanical condition at the pylorus. He felt that the all-important factor in the operation was to secure permanent drainage of the most dependent portion of the stomach, and the only operation which had been used a sufficient length of time to justify the statement that it was the best, he felt, was gastro-enterostomy. He felt that if pyloroplasty was going to be of benefit to the patients it must be done early, in order to avoid ulceration and changes in the gastric secretions which lead on to malignant disease. He also expressed the opinion that so soon as it became demonstrated to the physician that surgical operations were safe and afforded great relief, the cases should be sent to the surgeon much earlier.

Dr. J. M. T. Finney, of Baltimore, Md., confined his remarks to the consideration of the question of pyloric stenosis of benign origin, and believed that the main question was thorough drainage, and any method that would produce this result he felt would be satisfactory. He referred to the fact that the advocates of gastro-enterostomy were far in excess of those who recommended pyloroplasty at the present time, which he believed to be due largely to the fact that the operation had not been properly performed. He felt that much better results could be obtained by the conjunctive work of the physician and surgeon in these cases, not necessarily with a view to immediate operation, but for the purpose

of ascertaining the exact conditions present. He advocated early exploratory operation under cocaine. He felt that pyloroplasty was preferable to gastrojejunostomy from the fact that it makes the pylorus in a more normal position. The mortality in pylorectomy he felt was too high to justify its employment except in cases of pyloric cancer. He stated that he had employed the method as described by Hartman in eight case of pyloric cancer, each of which made good recoveries and lived varying lengths of time. Owing to the nature of the growth, however, and the necessary involvement of the lymphatic structures, he felt that it was practically impossible to eradicate entirely the cancerous growth, and that recurrence would take place in a great many instances, for which reason he felt that the method advocated by Dr. Mayo, of direct anastomosis of the lower end of the stomach to the duodenum would probably produce the best results. He felt that the operation of gastro-enterostomy had not been followed in all cases by the results claimed for it by some of the previous speakers, among the untoward effects frequently noted being the vicious circle and symptoms of pyloric obstruction due to the fact that the outlet was made too high up in the stomach.

Dr. J. Chalmers DaCosta commended the Academy on their good fortune in having had the opportunity of listening to such great workers in this line as Drs. Mayo, Vander Veer, Moynihan, Murphy, Finney, and Mikulicz-Radecki, and his appreciation of their courtesy in having participated in the papers and the discussions.

## BOOK REVIEWS.

ANATOMY OF THE BRAIN AND SPINAL CORD, WITH SPECIAL REFERENCE TO THE GROUPING AND CHANGING OF NEURONS INTO CONDUCTION PATHS. By HARRY E. SANTEE, M.D., Ph.D., Professor of Anatomy in the College of Physicians and Surgeons, University of Illinois; Professor of Anatomy in the Harvey Medical College, Chicago. Third edition. E. H. Colegrove, Chicago.

THE present volume is a convenient short description in 200 odd pages of the structure and anatomy of the nervous system. It is meant to serve the purpose of a laboratory manual and as such is to be commended very highly. As a text-book, however, for the general reader, it is of little service, being practically non-illustrated. For students, therefore, we can most heartily recommend it. For practitioners, however, unless they are actually doing dissections or have an accompanying atlas it will be found of secondary service only.

The author has compressed in very short compass a great deal of useful and well-ordered information. It, therefore, makes a very desirable small book of reference.

DISEASES OF THE STOMACH. By MAX EINHORN, M.D., Professor in Clinical Medicine at the New York Post-Graduate Medical School and Hospital; Visiting Physician to the German Dispensary. Third revised edition. William Wood & Company, New York.

AS AN authority on stomach diseases and as an ingenious inventor of diagnostic implements, Professor Einhorn is known the world over; it therefore is not surprising to find his book a practical and suggestive treatise on stomach affections. Rather too much space has been devoted to detailed descriptions of gastric sprays, stomach buckets, esophagoscopes and other instruments, yet the author, without sacrifice of clearness, has succeeded in keeping the book of reasonable size.

Besides the usual chapters on anatomy, physiology, diet, methods of examination, etc., the author divides the book into sections on Organic Diseases with constant lesions, Functional Diseases with variable lesions, abnormal size, shape and position, Nervous Affections, and Condition of Stomach in diseases of other organs. A valuable description is that of enteroptosis or Glénard's disease. We would suggest that such diseases as "Gastrosuccorrhea continua periodica," "Achylia gastrica," and "Ischochymia" be referred to by their English names; as we prefer "cancer of the stomach" to "carcinoma ventriculi."

No mention is made of Pawlow's valuable work on the digestive glands, nor of much recent work which is still the subject of controversy, though the numerous references show a wide range of reading.

A TEXT-BOOK OF LEGAL MEDICINE AND TOXICOLOGY. Edited by FREDERICK PETERSON, M.D., President of the New York Sate Commission in Lunacy, and WALTER S. HAINES, M.D., Professor of Chemistry, Pharmacy, and Toxicology in Rush Medical College. In two volumes. Vol. I. W. B. Saunders & Co., New York, Philadelphia, and London.

THIS first volume of Peterson and Haines Legal Text-Book comes at a time when works of this class are very much in demand. There has been nothing authoritative published in this country on this subject of recent years that is in any sense of the word up-to-date and modern, and the present volume, therefore, fits a need that is real and pressing. It not only fits a need from the standpoint of timeliness, but also sets a standard of what a text-book on toxicology and legal medicine should be.

It is a very large work, even if this first volume alone is taken into consideration and the chapters are all of practical interest to all types of medical men, not only neurologists and alienists but the general practitioner, surgeons and anyone having to do with the care or treatment of the sick.

From the illustrative point of view, the work is an exemplary one and we know of no other work along these lines that is more deserving of high commendation than the present one and we await the second volume dealing with toxicology with interest, trusting to be able to make a full analysis of the entire work on its appearance.

BACTERIA IN MILK AND ITS PRODUCTS. By H. R. CONN, Ph.D., Wesleyan University. P. Blakiston's Son & Co., Philadelphia.

NO MORE significant chapter in the history of modern science can be found than that dealing with the relationship of bacteria to agricultural processes, and in no single one of these processes is the story complete and more interesting than that dealing with dairying. In fact, successful dairying at the present time depends to a very large extent upon skill in handling bacteria, and no scientific cheese maker or butter manufacturer can meet the present conditions of supply in this and other enlightened communities without a knowledge of these microscopical organisms. Therefore, in every school of dairying and in every agricultural college, the study of bacteria has become a necessary part of the curriculum.

The present volume is intended to meet just this want. It is a short, popular and yet complete description of the various bacteria which are found in milk and a thorough discussion of the relationship of changes wrought in milk and milk products by bacterial enzymatic action.

It is written in the author's well-known and commendable style and is a book that can be read to advantage

by every physician, both in the city and in the country, since a knowledge of the changes that take place in milk are so essential in dietetics.

PHYSICAL CHEMISTRY FOR PHYSICIANS AND BIOLOGISTS. By Dr. ERNST COHEN. Translated by MARTIN H. FISCHER, M.D., Instructor in Physiology in the University of California. Henry Hall & Co.

THE developments of modern chemistry have, during the last decade been very markedly influenced by the teachings of Nernst and Ostwald, pioneers in the study of physical chemistry. Indeed so extensive have been the additions made, the alterations brought about and the new vantage points gained by this young science that the biological sciences have in their turn come under its sway. Indeed the science of physical chemistry has been necessary to explain many of the indirect life phenomena, so far as any theories, non-vitalistic or otherwise, can ever explain such phenomena.

The present series of lectures make a very excellent introduction to the study of physical chemistry and it can be most heartily commended to the medical profession.

There is, perhaps, a little too much mathematics for the average man, but mathematics are unfortunately essential to the understanding of molecular physics. The mathematics, however, in the present volume have been reduced to a minimum, making it one of the most serviceable of recent additions to this growing branch of science.

BACTERIOLOGY. A Manual for Students and Practitioners. By FRED. C. ZAPFFE, M.D., Professor of Pathology and Bacteriology in the Illinois Medical College; Professor of Histology in the Department of Medicine and in the School of Dentistry of the University of Illinois, Chicago. Series edited by BERN B. GALLAUDET, M.D., Demonstrator of Anatomy and Instructor in Surgery, College of Physicians and Surgeons, Columbia University, New York; Visiting Surgeon, Bellevue Hospital, New York. Illustrated with 146 engravings and 7 colored plates. Lea Brothers & Co., Philadelphia and New York.

ANOTHER volume of Lea's Series of Pocket Textbooks has recently been published and fully maintains the high standard set by the previously appearing volumes of this convenient series. The book has been written especially to fulfill the needs of the student, all unnecessary scientific discussions having been excluded, but the general practitioner will find it a very handy reference book upon the subject, for it contains not only a full and comprehensive treatment of the subject itself but also particular attention has been given to its practical relation to medicine. The illustrations and plates are numerous and have evidently been prepared with considerable care, for they well serve the purpose of explanation and elucidation. The laboratory methods are given in sufficient detail to be of service to the student and the material is complete enough to serve the purpose of any class-room work.

SYSTEM OF PHYSIOLOGIC THERAPEUTICS. Edited by S. S. COHEN, A.M., M.D. Vol. X. Pneumotherapy Including Ærotherapy and Inhalation Methods and Therapy. By Dr. P. L. TISSIER, Assisting Consultant Physician to Laennec and Lariboisiere Hospital, Chief-of-Clinic in the Faculty of Medicine of the University of Paris. P. Blakiston's Son & Co., Philadelphia.

THIS is a further contribution to the System of Physiologic Therapeutics outlined by Dr. Cohen and the present volume makes a very worthy addition to the system. The work is divided into two parts, Part I on Ærotherapy and Part II on Inhalation Methods and Therapy. Air as a therapeutic agent had been utilized from very ancient times, but exactness in methods of limitation and clearly defined lines of therapy have been wanting until comparatively recent times.

The author here gives a short summary and then plunges into the physiological relations of the atmosphere, its position and character to respiration. This is all discussed in 36 pages, hence it can be readily seen that this therapeutical portion of it is compressed. Open-air treatment of tuberculosis naturally comes in for a large share of the author's descriptions.

Special chapters on artificial pneumotherapy, compressed air, both high atmospheric pressure, pneumatic chambers, etc., are well considered, the book being rich from the standpoint of procedure and apparatus particularly.

In Part II the various methods of inhalation by which air charged with medicinal substances is introduced into the air passages is considered at great length.

The book is an extremely practical one and whereas, in places, perhaps a trifle optimistic in its teachings concerning the value of the various methods employed, is one whose facts should be in the possession of every practitioner.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by Dr. H. A. HARE and H. R. M. LANDIS. Vol. II, June, 1903. Lea Brothers & Co., New York and Philadelphia.

THIS present volume contains the report of progress on the surgery of the abdomen, advances in the field of gynecology, new researches on diseases of the blood, ductless glands, the hemorrhagic diseases and diseases of metabolism and an article on ophthalmology. These are contributed by Drs. W. B. Coley, John G. Clark, Alfred Stengel, and Edward Jackson.

The same high praise that it has been our privilege and pleasure to accord to Progressive Medicine in the past is its due in the present number. We have rarely seen so valuable a work that has kept its high standard for so long a time, and, from the evident mutual understanding of editor and contributors, there is little reason to believe that Progressive Medicine will ever sink into second rank, but will always remain a leader in this type of work.

## BOOKS RECEIVED.

*The* MEDICAL NEWS *acknowledges the receipt of the following new publications. Reviews of those possessing special interest for the readers of the* MEDICAL NEWS *will shortly appear.*

SURGICAL ASEPSIS. By Dr. H. B. Palmer. 8vo, 231 pages. Illustrated. F. A. Davis Co., Philadelphia.

A TEXT-BOOK OF CHEMISTRY. By Dr. E. C. Hill. 8vo, 523 pages. Illustrated. F. A. Davis Co., Philadelphia.

STUDIES IN THE PSYCHOLOGY OF SEX. By Dr. Haverlock Ellis. 8vo, 266 pages. E. A. Davis Co., Philadelphia.

PROGRESSIVE MEDICINE. Vol. II. June 1903. 8vo, 435 pages. Illustrated. Lea Brothers & Co., New York and Philadelphia.

SYPHILIS IN DENTISTRY. By Drs. L. B. Baldwin and E. R. Larned. 8vo, 120 pages. Illustrated. E. H. Colegrove, Chicago.

DISEASES OF THE PANCREAS. By Dr. E. L. Opie. 8vo, 360 pages. Illustrated. J. B. Lippincott Co., Philadelphia and London.